FY 2021

Annual Report

Nuclear Regulation Authority

The Nuclear Regulation Authority reports the state of affairs under its jurisdiction to the Diet based on the provisions of Article 24 of the Act for Establishment of the Nuclear Regulation Authority (Act No. 47 of 2012).

Major Activities in Fiscal Year 2021

(1) Rigorous and Proper Implementation of Regulations (Review) and Continuous Improvement of Regulatory Requirements

For commercial power reactors, the NRA permitted changes in basic design to conform to new regulatory requirements at the Shimane Nuclear Power Station Unit 2 of Chugoku Electric Power Co., Inc., and also approved a design and construction plan to conform to new regulatory requirements at the Onagawa NPS Unit 2 of Tohoku Electric Power Co., Inc. Regarding the special facilities for severe accident management, the NRA permitted changes in basic design at the Tokai Daini NPS of Japan Atomic Power Company, and approved design and construction plans at the Mihama PS Unit 3 and the Ohi PS Units 3 and 4 of Kansai Electric Power Co., Inc. The NRA approved the changes in operational safety programs at the Mihama PS Unit 3, the Ohi PS Units 3 and 4 of Kansai Electric Power Co., Inc., the Ikata NPS Unit 3 of Shikoku Electric Power Co., Inc., and the Genkai NPS Units 3 and 4 of Kyushu Electric Power Co., Inc. Also, a decommissioning plan was approved for TEPCO's Fukushima Daini NPS Units 1 to 4.

For nuclear fuel cycle facilities, etc., permission was granted for changes in facility operations related to the JNFL's category 2 waste disposal facilities, approval for design and construction plans for HTTR, etc., for changes in operational safety programs of the JAEA, and for the decommissioning plan at Toshiba NCA. In addition, the NRA received and published reports on the review status of JNFL's fuel reprocessing facility and MOX fuel fabrication facility, as well as the decommissioning status at the JAEA's Tokai Reprocessing Plant.

As for continuous improvement of regulatory requirements, steady progress has been made in the development of regulatory requirements, etc. for category 2 waste disposal, etc. and seismic isolation of buildings and structures, development of criteria for deciding the completion of decommissioning of nuclear fuel facilities, and formulation of criteria for approving decommissioning of usage facilities. Regulatory requirements were revised to reflect review experience and past records, and studies relating to continuous safety improvement were also promoted. Regarding the introduction of standard response spectrum into regulatory requirements, related regulatory requirements were revised in April 2021, and the review of permission to change basic design and discussion on the necessity of changing design ground motion were started.

(For details, see Sections 1 and 2 of Chapter 2.)

(2) Rigorous and Proper Implementation of Regulations (Inspection)

In May 2021, a comprehensive assessment of inspection results for FY2020, the first year of the new inspection system, was carried out, in which TEPCO's Kashiwazaki-Kariwa NPS was assessed as having long-term or serious deteriorations in safety and security activities, resulting in a plan to increase baseline inspections and conduct supplemental inspections in FY2021. Other nuclear facilities were assessed as being in stages in which autonomous improvements can be expected, and the continuation of regular baseline inspections was planned in FY2021. In nuclear regulatory inspections carried out by the 3rd quarter of FY2021, there were 26 inspection findings, and in all cases, the significance level was "green" (no additional action for nuclear fuel cycle facilities, etc.) and the severity level was determined to be SLIV.

Regarding the unauthorized use of an ID card and partial loss of function of physical protection equipment at TEPCO's Kashiwazaki-Kariwa NPS, which were discovered in FY2020, the NRA

issued an order of corrective measures, etc. pursuant to the Nuclear Reactor Regulation Act on April 14, 2021. From April 2021, the NRA has carried out supplemental inspections, consisting of detailed investigation of the facts (Phase I), confirmation of the operational status of corrective actions (Phase II), and confirmation of the status of responses to inspection findings designated in confirmation of operational status as necessary (Phase III). Phase II inspections are currently in progress, and on April 27, 2022, the NRA received an interim summary report on the inspection results thus far and came to agreement on how to proceed with future supplemental inspections including the actions requested to TEPCO and the perspective of their evaluation in confirming the implementation status of corrective action plans. Based on that policy, the NRA will proceed with supplemental inspections by focusing on the implementation status of corrective action plans.

(For details, see Section 1 of Chapter 2.)

(3) Ensuring the Safety of Decommissioning of TEPCO's Fukushima Daiichi NPS and Efforts for Discharge of ALPS-Treated Water into the Sea

The NRA is conducting a rigorous review of the application for approval to change the implementation plan submitted by TEPCO, while monitoring various efforts to ensure safety. In FY2021, the NRA reconsidered the concept of seismic design applied to the facilities of the Fukushima Daiichi NPS and requested TEPCO to re-evaluate the seismic classes based on this concept, including the projects that had already been applied for.

In light of the Basic Policy on Handling of ALPS-Treated Water at the Tokyo Electric Power Company Holdings' Fukushima Daiichi Nuclear Power Station, determined at the 5th meeting of the Inter-Ministerial Council for Contaminated Water, Treated Water and Decommissioning Issues (April 13, 2021), the NRA agreed on the following on April 14, 2021: reviewing whether or not the discharge of ALPS-treated water into the sea meets the regulatory requirements pursuant to the Reactor Regulation Act, confirming that the operation is in line with the government policy, and making efforts to raise objectivity and transparency in the review, etc. of the implementation plan through the review by IAEA.

Thereafter, on December 21, 2021, TEPCO applied for approval to change implementation plans related to the discharge of ALPS-treated water into the sea, which is under discussion at a public review meeting. Regarding the implementation of sea area monitoring before and after the discharge of ALPS-treated water into the sea, the Comprehensive Monitoring Plan was revised in March 2022, and it was decided that related organizations strengthen and expand their plan from FY2022. The NRA will strengthen and expand the plan by adding tritium measuring points to collect water from the lower depths in addition to the surface at some of the measuring points.

(For details, see Sections 1 and 3 of Chapter 4.)

(4) Promotion of Nuclear Security Measures

To strengthen the nuclear security plans, review criteria, etc. for physical protection measures for nuclear material related to cybersecurity countermeasures were revised in March 2022, and upon receiving applications for approval to change physical protection programs for commercial power reactor facilities, the NRA conducted rigorous reviews. Through implementation of on-site inspections relating to the security of specified radioisotopes, the NRA steadfastly carried out, and made effort to establish the base of regulation for the security of specified radioisotopes.

To prevent nuclear security incidents and allow prompt response in the event of an incident, it was decided to station Security Officers at NRA Regional Offices, and develop a work environment that includes a highly confidential network between the NRA and NRA regional offices.

(For details, see Sections 1 of Chapter 3.)

(5) Continuous Improvement of Nuclear Emergency Preparedness and Response

The NRA Guide for Emergency Preparedness and Response and the "Distribution and Administration of Stable Iodine" were revised to further clarify who should be evacuated at the stage of a facility site emergency in the event of a nuclear disaster, and at the same time, basic requirements for thyroid gland exposure dose monitoring in emergencies were examined to revise and establish the NRA Guide for Nuclear Emergency Preparedness and Response and the "Facility Requirements for Nuclear Emergency Core Hospitals."

(For details, see Sections 3 of Chapter 5.)

*All data for FY2021 in the report indicates figures up to March 31, 2022 unless otherwise specified.

The description of corporate status such as "company incorporated" and "national research and development agency" are omitted, and "Tokyo Electric Power Company Holdings" and "Japan Atomic Energy Agency" are abbreviated as "TEPCO" and "JAEA," respectively.

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Chapter 1 Ensuring Independence, Impartiality and Transparency, and Improving the Organizational Structure/System

○ **Summary of Chapter 1**

(Nuclear Regulatory Activities that Embody the Core Values and Principles of the NRA)

Based on its organizational philosophy, the NRA has continued to strive to ensure transparency, including thorough public discussions and made its decisions in an impartial, neutral and independent manner from the scientific and technological viewpoints.

In FY2021, the NRA strove for greater diversity of communications with local residents and nuclear operators including explanatory meetings in local communities on the review results of permission for changes in basic design at the Shimane NPS Unit 2 of Chugoku Electric Power Co., Inc., exchanges of opinions with Chief Executive Officers (CEOs) of eight operators and two opinion exchange meetings with Chief Nuclear Officers (CNOs). The NRA also decided to hold brief meetings with CEOs on a flexible basis to exchange views as to specific themes. Such a meeting was held on April 12, 2022. It was also decided that the NRA would start issuing the "Information Notice for Nuclear Operators," referencing the US NRC Information Notices

As part of PR efforts, the NRA produced 11 videos with themes such as "Experiences of Government Emergency Responses to Fukushima Daiichi NPS Accident" and "Findings from the Investigation of Fukushima Daiichi NPS," so as not to let the memory of the accident fade and renew our pledge not to allow such an accident happen again. The videos were disseminated via online video sites in time to mark the 10th anniversary of the Great East Japan Earthquake and the accident at the Fukushima Daiichi NPS. The NRA also renewed its website after refining the structure that enables web visitors to quickly find desired sites and reopened the site in November 2021.

(Enhancement of Infrastructure to Support Regulatory Operations)

The NRA worked to systematize management-related documents by developing manuals for each of the main processes covering its jurisdiction and links to existing manuals for individual jobs to allow for ongoing improvements to the management system. The NRA also changed inspection items to better understand the present organizational status on a steady basis, and conducted questionnaire surveys and interviews of staff. It was also decided that the NRA promptly receives reports from the Secretariat of the NRA on issues to be specially mentioned, such as unreviewed portions of requirements for regulatory dispositions, among the matters requiring improvement of operation.

Regarding international relations, some scheduled meetings were postponed or suspended due to the effects of the COVID-19 pandemic, but the use of online conferencing opened up new avenues for communication, whereupon numerous key opportunities to exchange views and engage in discussions emerged. The NRA decided to undergo a review by the IAEA to increase objectivity and transparency in the review and confirmation concerning the discharge of water treated with the Advanced Liquid Processing System (ALPS) at the TEPCO's Fukushima Daiichi NPS and monitoring sea area. A preparatory meeting of the regulatory review mission was held with the IAEA in February 2022, followed by a plenary session in March 2022. There was a general consensus that the NRA is moving towards applying regulatory processes and details in accordance with international standards.

The NRA approved a final report in September 2021 stating that no information leak was observed within the scope of the investigation on the external attack to the NRA's

network system that occurred in 2020 and that recurrence prevention measures must be incorporated in a new system to be developed. On December 20, 2021, the NRA started operating a new system, which reinforced security measures, boosted information security and enhanced information security education for staff.

(Securing and Developing Personnel Resources)

In FY2021, the NRA adopted 26 new graduates, and employed 16 experienced persons. The NRA Human Resource Development Program was implemented in a total of 14 universities and other institutions in FY2021.

For human resource development of the NRA staff, the competence of staff was also managed in this fiscal year by awarding qualifications in 5 job fields and this was reflected in their assignment and salary. Knowledge management activities, such as e-learning for transferring and sharing administrative experiences and technological knowledge, were continued.

"The Basic Policy on Human Resource Development for NRA Staff" was revised by adding the involvement of the personnel management offices in relation to career paths, and to strengthen expertise, etc. of staff, the NRA set career path images representing expected roles according to the tenure in the same assignment classes, the areas of specialization that should be held, the provision of opportunities to improve expertise, and the applicable qualifications that can be acquired for main career positions and general technical and clerical staff.

To promote human resource cultivation and personnel exchanges by utilizing joint research, the NRA had a total of 58 research staff members engage in joint research and mutually dispatched staff members with the JAEA.

(Response to COVID-19 Transmission)

Continued from FY2020, the NRA took measures to prevent COVID-19 transmission based on the declaration of a state of emergency and other government-wide efforts. When a state of emergency was declared, the NRA banned general audiences at meetings and cut staff attendance by 70% as a goal. Most of review meetings, etc. were held as online conferences throughout the fiscal year.

For reviews based on the Reactor Regulation Act, the NRA took steps to minimize the impact on the review works and steadily moved forward by conducting review meetings and hearings using online conferencing systems. Of nuclear regulatory inspections, routine inspections conducted primarily by NRA Regional Offices were generally performed as originally planned. Team inspections conducted primarily by inspectors dispatched from the headquarters of the Secretariat of the NRA, meanwhile, were performed by changing inspection plans. Regarding notifications and inspections under the Radioisotope Regulation Act, flexible operations, which were carried out within a reasonable scope in terms of deadlines, periods and frequencies from FY2020, were basically completed in October 2021.

Examinations and lectures based on laws and regulations including the Radiation Protection Supervisor Examination were carried out by taking appropriate measures to prevent COVID-19 transmission.

Section 1 Implementation of Regulatory Activities that Embody the Core Values and Principles of the NRA

1. Efforts for Ensuring Independence, Impartiality and Transparency of Nuclear Regulatory Administration

(1) Ensuring Independence

Independent decision-making is vital for effective regulation and is also emphasized by many foreign nuclear regulatory organizations as one of the most significant factors of their own organizational philosophy. The NRA, which was established as a highly independent Article 3 Authority, states that "we shall make decisions independently, based on the latest scientific and technological information, free from any outside pressure or bias" in "NRA's Core Values and Principles." While attempting to ensure transparency by thoroughly implementing public discussions and so on, the NRA is continuing to make decisions in an impartial, neutral and independent manner from scientific and technological viewpoints. Independence of nuclear regulatory administration was ensured through thorough discussion and decision making from the scientific and technological point of view at 76 NRA Commission Meetings (on a total of 268 subjects) throughout the year in FY2021.

(2) Ensuring Impartiality

The NRA defined the "Code of Conduct related to Ethics for the NRA Chairman and Commissioners" at the 1st FY2012 NRA Commission Meeting (September 19, 2012). The Code stipulates that the Chairman and the Commissioners must not receive donations from nuclear operators during their term of office and that they must disclose information on any donations which they received in the 3 years prior to assuming office. Further, they must disclose any situation involving their students finding jobs with nuclear operators. Information on 5 members appointed as of the end of FY2021 has also been fully disclosed on the NRA website.

At the 4th FY2012 NRA Commission Meeting (October 10, 2012), the "Requirements for Ensuring Transparency and Impartiality when the NRA Takes Advice from External Experts as a Reference in Making a Decision on Nuclear Safety Regulations, etc. for Electric Utilities" were defined. These requirements stipulate thorough disclosure on the relationship between external experts and electric operators when the NRA asks views from external experts regarding nuclear regulations on electric operators and other issues. Furthermore, when asking external experts to review the safety of individual facilities or re-review early assessments of individual facilities, the NRA requires experts to confirm that they have not served as executives of the relevant electric operators in the previous 3 years, that they have not personally received 500,000 yen or more as remuneration during one fiscal year from relevant electric utilities and that they have not been involved in earlier examinations of said facilities. The same requirements were established for the appointment of members of the Reactor Safety Examination Committee (RSEC), the Nuclear Fuel Safety Examination Committee (NFSEC) and the Radiation Council.

In FY2021, based on these requirements, the self-enumerated information from external experts belonging to various study groups was made public on the NRA website.

(3) Ensuring Transparency

In accordance with the "Policy on Ensuring Operational Transparency of the NRA" established at the 1st FY2012 NRA Commission Meeting (September 19, 2012), and with the (i) building of an information disclosure system eliminating the need for disclosure requests, (ii) thorough public discussions, and (iii) thorough document-based administrative actions as basic policies, the NRA decided to open the Commission Meetings, Councils, and examination and study group meetings to the public, publicly disclose the minutes of meetings and the materials used in these meetings, and deliver the meetings live via Internet video sites[1].

In accordance with the above policies, the NRA has to prepare summaries of all meetings regarding regulations which are attended by 3 or more Commissioners or interviews of nuclear operators by the NRA Chairman, Commissioners, or staff of the Secretariat of the NRA, and make them public together with the names of the participants and the reference materials used. In addition, the NRA has to make briefings about the important meetings at the NRA Commission Meetings.

To encourage research staff to actively exchange views on research at academic meetings, the "Policy on Ensuring Operational Transparency of the NRA" was revised at the 45th FY2021 NRA Commission Meeting (November 17, 2021), stipulating that the NRA need not create and release summaries of opinion exchanges at academic meetings participated by staff members engaged in safety research in the Regulatory Standard and Research Department (except the Directors of the Department).

In FY2021, the NRA steadily implemented the efforts to ensure transparency such as the above and made the materials used for these meetings available on its website simultaneously with the start of live delivery of those meetings on Internet video sites, for the convenience of viewers of those meetings. The minutes of meetings of regular press conferences by the NRA Chairman (hereinafter referred to as "Chairman's press conferences") and regular briefings by the Secretariat of the NRA were posted on its website within the next day whenever possible.

As a rule, Chairman's press conferences were held once weekly and regular briefings by the Secretariat of the NRA twice weekly (48 Chairman's press conferences and 91 regular briefings by the Secretariat of the NRA were held in FY2021). When the NRA Chairman and/or Commissioners visit the nuclear site for on-site surveys, on-site interviews or on-site tour, the accompanying staff interviewed the chairman or commissioners and took pictures after the scheduled events are completed (in FY2021, 15 such visits were conducted).

Following FY2020, the NRA helped mitigate the COVID-19 pandemic by holding review meetings with nuclear operators, etc. and study team meetings, via online conferencing systems in principle. In FY2021, the NRA also used the same system to hold and stream the NRA Commission Meetings, depending on the states.

[1] "YouTube" and "niconico channel"

The NRA also worked to improve the transparency of reviews. Based on discussions on the basic concept of publishing the results of meetings, etc. with nuclear operators at the 38th and 45th FY2018 NRA Commission Meetings (October 31 and December 5, 2018), the automatically transcribed minutes on interviews with nuclear operators have been published since April 2019 (852 minutes in FY2021).

In addition, it was decided to hold liaison and coordination meetings as needed, starting in FY2019, with the Agency of Natural Resources and Energy, the Nuclear Damage Compensation and Decommissioning Facilitation Corporation, TEPCO and other relevant organizations to improve transparency of coordination, etc. required for proper work relating to accident analysis and decommissioning at TEPCO's Fukushima Daiichi NPS. In FY2021, liaison and coordination meetings were held twice in relation to the decommissioning and accident investigation at the Fukushima Daiichi NPS.

2. Enhancing External Communication

(1) Enhancing Efforts on Diverse Communication

The NRA Commissioners have visited nuclear facilities and exchanged opinions with local parties in accordance with the "Policy on Commissioners' Visits of Nuclear Facilities and Exchanges of Opinions with Local Parties" decided at the 49th FY2017 NRA Commission Meeting (November 15, 2017).

NRA Chairman FUKETA and Commissioner BAN had planned to exchange opinions with local parties in Saga Prefecture, and visit the Genkai NPS of Kyushu Electric Power Co., Inc. in June 2021, but the plan was postponed in light of measures to prevent COVID-19 transmissions.

The NRA explained nuclear regulatory activities based on requests from local governments. In FY2021, the NRA explained the review results of permission for changes in basic design at the Shimane NPS Unit 2 of Chugoku Electric Power Co., Inc. to local communities and at briefings for local residents.

Since October 2014, the NRA has been holding exchanges of opinions with chief executive officers (CEOs) of major nuclear power facilities to promote efforts fostering safety culture and enhancing safety by nuclear operators and to hear their basic policy for safety improvement activities and perspectives on the current regulatory system for continuous safety improvement. In FY2021 the NRA exchanged opinions with eight nuclear operators, mainly concerning activities and how the safety of their facilities could be further improved. Three online conferences were held to discuss appropriate measures to prevent COVID-19 transmission. Furthermore, the 64th FY2021 NRA Commission Meeting (February 9, 2022) approved the decision to utilize the online conference system as well as existing opinion exchanges and hold shortened CEO meetings on a flexible basis. A meeting was held with the Hokkaido Electric Power Co., Inc. on April 12, 2022.

In addition, the NRA has been holding exchanges of opinions with chief nuclear officers (CNOs) since January 2017 to contribute to the smooth introduction of regulation and improvement and clarification of regulatory requirements and reviews for the purpose of enhancement of its predictability. In FY2021, the NRA held two

opinion exchange meetings with CNOs (with ATENA[2] in attendance) concerning the improvement of severe accident measures.

It was also decided to newly issue "Information Notice for Nuclear Operators" based on Information Notice operated by the US Nuclear Regulatory Commission (NRC) as a way to raise awareness of regulatory authorities. This plan was approved at the 58th FY2021 NRA Commission Meeting (January 12, 2022).

The NRA is striving to enhance communication with nuclear operators through these activities.

(2) Efforts for Developing the Information Management System

The NRA Archive Document Search System "N-ADRES" (a system to archive and publicly disclose important information posted on the NRA website) was renovated in association with the renewal of the website in November 2021 and has since been stably operated.

(3) Reinforcing the Transmission of Information on Activities of the NRA

Efforts were made to reinforce the prompt and detailed information transmission to the public in response to the high levels of societal interest in nuclear regulations.

The NRA distributed summaries of discussions at NRA Commission Meetings that are considered as high social interest, information on legal reports, and information on the impact of earthquakes through Twitter. The NRA also continued to post results and summaries of its discussions on the NRA website.

Regarding efforts of high importance and social concern for accident analysis, particularly on-site investigations inside reactor buildings, the NRA publicly disclosed videos taken at the site, and using Twitter, promoted the dissemination of information on analysis of TEPCO's Fukushima Daiichi NPS accident.

In light of the fact that FY2021 marked the 10th anniversary of the Great East Japan Earthquake and the accident at TEPCO's Fukushima Daiichi NPS, the NRA produced 11 videos with the themes such as "Experiences of Government Emergency Responses to Fukushima Daiichi NPS Accident" and "Findings from the Investigation of Fukushima Daiichi NPS," and released them in Internet video sites The idea was to keep memories of the accident fresh and reaffirm the pledge never to allow such an accident to be repeated.

[2] An organization established by operators and manufacturers to address common technical issues in the nuclear industry as a whole. Since the opinion exchange meeting with CNOs in FY2019, such meetings have been held including ATENA on a trial basis.,

Additionally, the NRA released its renewed website on November 1, 2021 after improving the structure of website by modifying the categories for facilitating visitors to find desired pages quickly as well as optimizing the screen layout for easier viewing on mobile terminals. In January 2022, the NRA conducted a questionnaire survey for its website users and staff and will study further improvements in future based on the results.

3. Allegation Process Regarding Safety Information on Nuclear Facilities

To detect likely illegal activities by nuclear operators at an early stage and prevent nuclear accidents, the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Rectors (Act No. 166 of 1957; hereinafter referred to as the "Reactor Regulation Act") provides for the "Allegation System of Nuclear Facilities Safety Information." Under this system, the NRA investigates allegation cases responding to information reported by employees or any others on potential illegal activities committed by nuclear operators and, if necessary, issues directives or instructs corrective measures to the relevant nuclear operators.

To ensure the impartiality and transparency of investigations by the NRA, the Nuclear Facility Safety Information Allegation Committee consisting of external experts was launched. Under the supervision of the Committee, the NRA will process allegations as promptly as possible while paying attention to privacy protection of the informant and disclose the operational status of the allegation system. In FY2021, one new case was accepted (processing in progress), while cumulative five cases were completed.

Section 2 Enhancement of Infrastructure to Support Regulatory Operations

1. Continuous Improvement of Management System

The NRA, based on the "mid-term goals for the NRA's second term" (adopted at the 61st FY2019 NRA Commission Meeting (February 5, 2020)) and the issues highlighted in the IRRS[3] follow-up mission received in January 2020, the NRA strove to improve the management system on an ongoing basis. It also formulated an "Action Plan on the Management System and Nuclear Safety Culture" (adopted at the 16th FY2020 NRA Commission Meeting (July 15, 2020)), which aimed to develop and maintain a nuclear safety culture and started related initiatives alongside.

In FY2021, the NRA worked to systematize management-related documents by compiling manuals for each of the 27 main processes covering the jurisdiction of the NRA and linkages with existing manuals for individual jobs as part of efforts to refine the management system on an ongoing basis.

[3] Integrated Regulatory Review Service

Following FY2020, the NRA conducted a questionnaire survey and interviewed staff to develop and maintain a nuclear safety culture. On this occasion, the NRA also acquired knowledge of external experts and reviewed survey items to ensure a constant understanding of the current status of the organization from the survey. The management review in March 2022 evaluated the survey results and activities relating to nuclear safety culture in 2021, then reflected this evaluation in FY2022 activity plan.

The NRA conducted internal audits of its operations and management of issues requiring improvement based on the NRA Management Rules. Six divisions were subject to internal audits, and eight cases of good practice and one case requiring improvement were identified. There were 29 new cases requiring improvements in FY2021. The NRA received reports on the management of issues to be improved from the Secretariat collectively in the management review in March every year. It was, however, decided at the 34th FY2021 NRA Commission Meeting (September 22, 2021) to promptly receive reports on issues requiring improvement such as those which relate to regulatory treatment (including unreviewed requirements and defective treatment), those which may impact significantly on the operation by the NRA and other noteworthy matters.

The NRA conducted management reviews at the 69th FY2021 NRA Commission Meeting (March 2, 2022) and the 70th FY2021 NRA Commission Meeting (March 9, 2022) to evaluate its operational achievements in FY2021. Based on the evaluation results, the "NRA Annual Operational Plan for FY2022" was determined at the 73rd FY2021 NRA Commission Meeting (March 23, 2022).

2. Cooperation with International Organizations and Contribution to the International Community

In FY2021, some of scheduled meetings were postponed or suspended due to the effects of the COVID-19 pandemic, but through online conferencing in place of face-to-face meetings, new opportunities for communication were promoted, at which numerous key opinions were exchanged and discussions ensued.

(1) Cooperation with International Organizations

The NRA continued to share findings and lessons learned from the accident at TEPCO's Fukushima Daiichi NPS with the international community and improved international nuclear safety through information dissemination and opinion exchange by attending meetings of and dispatching experts to the International Atomic Energy Agency (IAEA) and the Organisation for Economic Co-operation and Development/Nuclear Energy Agency (OECD/NEA).

In particular, in FY2021 the NRA attended international meetings of the IAEA's Commission on Safety Standards (CSS), Nuclear Safety Standards Committee (NUSSC), Waste Safety Standards Committee (WASSC), Transport Safety Standards Committee (TRANSSC), Radiation Safety Standards Committee (RASSC), Emergency Preparedness and Response Standards Committee (EPReSC), Nuclear Security Guidance Committee (NSGC) and the International Commission on Radiological Protection (ICRP) and contributed to the formulation of international standards and the formation of common understanding through discussion based on the latest findings in

Japan. (See Section 2 of Chapter 2 for information on joint research with international organizations.)

As a part of its international communication efforts, the NRA has continued to regularly release sea area monitoring results including those in the surrounding areas of TEPCO's Fukushima Daiichi NPS. In collaboration with the IAEA, the NRA jointly collected samples near the NPS and carried out inter-laboratory comparisons of the analysis results.

This collaborative collection of marine samples and inter-laboratory comparison of analysis results have been done every year since FY2014, and in November 2021, experts relegated from the IAEA as well as experts at analysis institutes in France, Germany and Korea came to Japan and checked the status of sample collection.

Since February 2020, data on environmental radiation (air dose rate) collected from representative monitoring posts in Japan and gathered by the NRA has been sent to the International Radiation Monitoring Information System (IRMIS) established by the IAEA as a framework for collecting and sharing environmental radiation monitoring information in each country.

Additionally, Japan has proactively contributed to improving technical capacity of the IAEA and other member states on safeguards through frameworks including the Japan Support Programme for Agency Safeguards (JASPAS).

To improve the objectivity and transparency of processes and details of review and confirmation as to applications for approval to change implementation plans for installing an ocean discharge facility for water treated with the Advanced Liquid Processing System (hereinafter called "ALPS-treated water") at TEPCO's Fukushima Daiichi NPS as well as sea area monitoring, the NRA decided to undergo a review by the IAEA to be conducted pursuant to the terms of reference for the comprehensive cooperation framework on the handling of ALPS-treated water, which was signed between IAEA and the Government of Japan in July 2021. A preparatory meeting of the regulatory review mission was held in February 2022, followed by a plenary meeting in March 2022. The NRA basically shared with the IAEA the perception that the NRA planned to apply the process and details of regulations in accordance with international standards.

(2) Participation in Initiatives under Various International Conventions on Nuclear Safety

Together with the relevant ministries and agencies, the NRA is participating in various international initiatives under the frameworks of the Convention on Nuclear Safety, the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (Joint Convention), the Convention on Early Notification of a Nuclear Accident, the Convention on Assistance in the case of a Nuclear Accident or Radiological Emergency, the Convention on the Physical Protection of Nuclear Material (CPPNM), the Amendment to the Convention on the Physical Protection of Nuclear Material (A/CPPNM) and the International Convention for the Suppression of Acts of Nuclear Terrorism.

(3) Cooperation with Overseas Nuclear Regulatory Authorities in the Multinational Framework

From the viewpoint of improving nuclear safety, etc., the NRA is promoting information exchange with nuclear regulatory bodies in other countries as described below.

The International Nuclear Regulators' Association (INRA), consisting of the heads of regulatory bodies in major countries having nuclear power stations, is a framework to exchange opinions twice a year, as a rule, on a wide range of issues on nuclear safety regulations. Nine countries, Japan, the U.S., France, the U.K., Germany, Canada, Sweden, Spain and Republic of Korea, participate in the INRA. The 47th INRA meeting was held online in place of face-to-face due to the effects of the COVID-19 pandemic. NRA Chairman FUKETA attended the meeting to represent Japan and engaged in wide-ranging discussions on nuclear regulations.

While the IAEA General Conference was held in September 2021, the 48th INRA meeting was held and hosted by the NRA in Vienna, Austria. NRA Chairman FUKETA attended the meeting and engaged in wide-ranging discussions on nuclear regulations.

In March 2022, an INRA meeting was held online in the wake of the Russian's attack on nuclear facilities following the invasion to Ukraine. It was generally agreed in the meeting that the INRA would provide technical assistance to the Ukrainian Regulatory Authority (SNRIU). On behalf of INRA, NRA Chairman FUKETA sent a letter to SNRIU offering technical assistance.

The Western European Nuclear Regulators' Association (WENRA) is a framework comprising the heads of nuclear regulatory bodies in mainly European countries and holds the plenary twice a year, as a rule. The NRA has participated in WENRA as an observer and attended the spring plenary meeting held online in April 2021. The NRA also attended online the fall plenary meeting held in Paris, France, in October 2021.

The Top Regulators' Meeting on Nuclear Safety (TRM) is a framework comprising the senior regulators of three nuclear regulatory bodies in Japan, People's Republic of China, and Republic of Korea. To improve nuclear safety and strengthen regional cooperation by sharing useful information on common issues and technological improvement relating to nuclear safety, it has been annually held since 2008. The NRA chaired the 13th TRM in November to December 2021. The meeting was held online under Chairman BAN, NRA Commissioner. At this meeting, the NRA provided information on how ALPS-treated water was regulated at the Fukushima Daiichi NPS and active discussions ensued.

(4) Cooperation with Overseas Nuclear Regulatory Authorities in the Bilateral Framework

The NRA has cooperation arrangements with 9 countries (10 nuclear regulatory organizations)[4] and in FY2021, exchanged information and opinions on nuclear regulations with foreign nuclear regulatory bodies through these bilateral frameworks.

The Japan-US Steering Committee was held online in November 2021 under the cooperation arrangement with the U.S. NRC. At the meeting, opinions were exchanged on the regulatory effects of COVID-19 and countermeasures, cybersecurity requirements and inspections in the U.S., and definitions of terminology to express situations in severe accidents.

NRA Chairman FUKETA made an official trip to Austria to attend the 65th IAEA General Conference in September 2021, and held face-to-face meetings with the chairman of the Nuclear Safety Authority of France (ASN), the chairman of the Canadian Nuclear Safety Commission (CNSC) and the Director-General of the Swiss Federal Nuclear Safety Inspectorate (ENSI) to exchange regulatory information.

As for another working level bilateral meeting, a regulatory information exchange meeting was held online with the Atomic Energy Council (AEC) of Taiwan Commissioners in July 2021 and views were exchanged on the latest regulatory situation and results of the accident investigation at the Fukushima Daiichi NPS. The NRA responded to questions from Republic of Korea in writing regarding the discharge of ALPS-treated water into the sea.

(5) Opinion Exchange with International Advisors

The NRA, with the aim of proactively incorporating the latest overseas knowledge concerning the safety of the use of nuclear energy, commissions foreign experts with abundant experience and advanced knowledge on nuclear regulation as international advisors to exchange opinions on issues such as expectations for nuclear regulatory systems and the organization of the NRA. In FY2021, opinions were exchanged in writing due to the effects of the COVID-19 pandemic.

3. Response to Information Security Incident

Continued from FY2020, the external attack on the NRA's network system on October, 2020 was investigated in details. The NRA received a final report stating that (i) no leakage of information, including documents prepared and officially used by staff, other than credentials of staff and contractors, was observed within the scope of the investigation and (ii) recurrence prevention measures, stemming from this incident, must be reflected in developing a new system at the 31st FY2021 NRA Commission Meeting (September 8, 2021) and instructed the Secretariat of the NRA to report it to the National center of Incident readiness and Strategy for Cybersecurity (NISC).

[4] U.S. Nuclear Regulatory Commission (NRC), U.S. Department of Energy (DOE), French Nuclear Safety Agency (ASN), UK Office for Nuclear Regulation (ONR), Russian Federal Service for Environmental, Technological and Nuclear Supervision (Rostechnadzor), Swedish Radiation Safety Authority (SSM), German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB), Spanish Nuclear Safety Council (CNS), Finish Radiation and Nuclear Safety Authority (STUK), Canadian Nuclear Safety Commission (CNSC)

From the occurrence of this incident to the start of the new system operation, external access with the NRA's network system was shut down. To mitigate the reduction of operational efficiency during this period, tentative email transmission and web browsing were allowed from terminals not connected to the NRA's network system as well as telephone and fax. To improve remote work environment, a USB thin client system was introduced.

Based on the incident, the NRA started a new system featuring reinforced security measures on December 20, 2021, and improved information security, including expansion of personnel and enhancement of information security education for staff.

4. Steady Response to Litigation Affairs and Administrative Appeal

The NRA responded to the legal and litigation affairs related to the work of the NRA in cooperation with relevant authorities. Specifically, the NRA has rapidly and appropriately prepared briefs and responded to examinations of witnesses in collaboration with the Ministry of Justice and related agencies with respect to 52 pending cases and 5 cases for which a judgment was made in FY2021.

The NRA examined and dismissed 4 formal appeals about the results of permission for changes in basic design.

5. Continuous Review and Improvement of Laws and Regulations

The NRA constantly reviewed and improved laws and regulations under its jurisdiction, by, for example, incorporating the latest scientific and technological knowledge into the regulatory requirements.

Specifically, the laws and regulations were established and revised as follows:

Table 1-1 Major Establishment and Revision of Laws and Regulations in FY2021 under the Jurisdiction of NRA

(Effective Date)	Names of Laws and Regulations	Overview
August 20, 2021	Selection of Internationally Controlled Materials based on the Provisions of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors (Notification)	Nuclear-related technologies were added to international controlled materials accompanying the revision of the Japan-UK Nuclear Co-operation Agreement.
October 21, 2021	NRA Rule on Category 2 waste burial of nuclear fuel material or material contaminated by nuclear fuel material	Maintenance of regulatory requirements regarding intermediate depth disposal, uranium waste burial and clearance
March 30, 2022	NRA Rule on Partially Revising the Regulation on the Installation and Operation of Research and Test Reactors	The rule changes report dates and subjects in reporting accidents and malfunctions from nuclear operators

Section 3 Securing and Developing Personnel Resources

1. Maintaining High Ethical Standards

The core values and principles of the NRA require performance of duties with high ethical standards, and to fulfill the NRA's mission of protecting people and the environment, each staff member carries out his or her duties in accordance with 5 Guiding Principles for Activities.

To ensure this, the NRA distributed a card indicating the NRA's core values and principles to all new staff members, and provided training in ethics for public servants (once in April and once in September).

During National Public Service Ethics Month in December, a message was distributed to all staff from the Ethics Supervisory Officer (Secretary-General of the NRA Secretariat). Efforts are being made to effectively inculcate ethical awareness by distributing awareness-raising posters and having all staff undergo training in ethics for public servants through e-learning.

To ensure work-life balance of the staff, the NRA implemented a "paternity childcare leave " and encouraged employees to take a summer vacation and annual leave.

2. Securing Human Resources for Nuclear Regulation

(1) Filling Personnel Positions

To attract large numbers of promising qualified personnel, the NRA actively carried out a campaign for recruitment including presentations on the activities/missions of the NRA to heighten interest in the organization.

For newly recruited staff members, the NRA employed candidates selected based on visits to government offices after passing the national civil service examination (career positions, general positions), implemented the "Nuclear Engineering Examination" (for general positions), which is the NRA Secretariat's original examination intended to proactively employ graduates who majored in nuclear engineering and at the same time, carried out open recruitment of new research staff in charge of technical research and surveys. The NRA adopted 26 new graduates for FY2022 (2 for career positions, 11 for general positions (university graduates), 9 for general positions (high school graduates), one through a nuclear engineering exam and three through a research staff recruitment exam), and later formally employed them.

The NRA conducted open recruitment for experienced persons from the private sector mainly in the areas of safety reviews and inspections, nuclear emergency preparedness and radiation hazard prevention, and employed 16 persons in FY2021.

The number of NRA staff is 1,008 with the ratio of personnel to the prescribed number of personnel becoming 92.6%, as of January 1, 2022.

Table 1-2 Situation of securing human resources from FY2015 to 2021 (Unit: persons)

	FY2015	FY2016	FY2017	FY2018	FY2019	FY 2020	FY 2021	Total
Experienced personnel*1	59	39	44	23	33	21	16	235
New graduates*2	19	19	25	29	22	29	26	169
Total	78	58	69	52	55	50	42	404

*1: Number of personnel hired during the period from April 1 to March 31 in the relevant fiscal year
*2: Number of personnel hired from the date of job offer in the relevant fiscal year to April 1 in the next fiscal year

(2) Efforts concerning the Program of NRA Human Resource Development

To broadly secure personnel and develop human resources engaged in nuclear safety and regulations aiming at steadily improving nuclear regulations, the NRA launched the subsidy program for human resource development for nuclear regulations. This program has been carried out in collaboration with universities and other institutions since FY2016. In FY2021, this program was applied in a total of 14 cases (4 cases adopted in FY2017, 4 cases in FY2020 and 6 cases in FY2021) implemented by universities and other institutions.

3. Developing Human Resources for Nuclear Regulation

(1) Personnel Career Paths

To clarify the basic principles and general framework of measures for development of staff as human resources, the NRA established a "Basic Policy on Human Resource Development for NRA Staff" in 2014 and set up career paths in April 2015 as models for administrative and research staff to accumulate experience and deepen responsibility, with the work performed by the NRA in mind.

In 2021, the abovementioned basic policy was revised by adding the involvement of the personnel management offices in relation to career paths at the 11th FY2021 NRA Commission Meeting (June 2, 2021) according to the progress made so far, including the establishment of a training system based on the basic policy, To strengthen expertise of staff, the NRA also set career path images showing expected roles according to the tenure in the assignment class, areas of specialization that should be reserved, the provision of opportunities to improve expertise, and acquirable job qualifications for general technical staff. At the 44th FY2021 NRA Commission Meeting (November 10, 2021), the NRA also set specific items in the career path image for general clerical staff as those for general technical staff. The NRA also decided to use OJT as a basis for improving the skills of back-office work mainly handled by general clerical staff, and as a means to use it effectively, introduced a competence management system. Trial operation is schedule to be launched in FY2022 and full operation in FY2023.

To provide personnel with appropriate career paths and ensure appropriate treatment, the NRA conducted a survey on satisfaction with post assignment in accordance with abilities and the results showed 37% were satisfied, 9% were dissatisfied and 54% were in the middle. These results will be used for reference in personnel management and surveys will continue to be administered in future.

(2) Implementing and Improving Training

Under the job qualification system for five job fields, "nuclear inspection," "nuclear safety review," "safeguard inspection," "emergency preparedness and response" and "regulation for radiation" adopted in FY2017, the NRA provided training and OJT and bestowed qualifications for 157 personnel.

Starting from FY2018, the NRA also provided education and training courses for job qualifications in five job fields (basic qualifications) in FY2021 to continually secure and develop human resources capable of handling regulatory work. The NRA improved and bolstered these courses by reviewing curricula and instructional methods. In FY2021, 15 personnel learned at the "intensive course" that makes trainees concentrate

on training away from work. Moreover, ten personnel were selected for the "part-time course" to take training while working. 17 personnel who had been taking the intensive course since FY2020 completed the education and training course in April 2021. To contribute to the review of curricula and instructional methods for education and training courses, the NRA started efforts to study ways to improve training programs from questionnaire results, and commenced continuous education and training courses to maintain bestowed qualifications.

Moreover, a training method incorporating active learning was introduced on a trial basis to improve the quality of training and e-learning for instructors was launched to support this method.

In FY2021, the competence of the NRA staff was continued to be managed by bestowing qualifications in 5 job fields and reflected in their assignments and salaries. Knowledge management activities, such as e-learning for transferring administrative experiences and technological knowledge, were also continued.

In light of measures to prevent COVID-19 transmission, appropriate steps were taken, such as adopting online lectures and changing implementation timing. Accordingly, all feasible training was appropriately carried out and despite the impact of COVID-19, around 2,500 persons in total received training throughout the year.

(3) Development of Human Resources for Research

In FY2021, to promote human resource cultivation and personnel exchanges by utilizing joint research, the NRA had 58 staff members engage in joint research, which is a number exceeding that in the previous fiscal year and, continuing from FY2020, dispatched 2 staff members to the JAEA for having them exclusively engage in research activities. The NRA also accepted staff members from the JAEA. One of them worked in research-related jobs. The NRA actively published research results such as those for safety research at academic societies and strove to improve the abilities of research staff through discussions with experts at academic meetings.

(4) Efforts Concerning Development and Securing of Global Human Resources

The NRA committed to recruiting human resources with a wealth of international experience, improving the competence of personnel engaged in international activities through education, training, research and international cooperation, encouraging young personnel to acquire experience in international activities, enhancing work environment for promoting participation in international activities, and improving the quality of staff training programs on international cooperation. Seven staff members have been posted to international organizations such as the IAEA and OECD/NEA. The NRA has also appointed mid-career and young personnel as representatives for international conferences to provide them opportunities to acquire international experience and play long-term and continuous roles as international human resources.

Section 4 Response to COVID-19 Transmission

1. Maintaining and Strengthening Organizational Function

On March 2, 2020, the NRA set up a task force led by the Deputy Secretary-General of the Secretariat of the NRA as the Director-General to cope with COVID-19 transmission. Throughout FY2021, the task force held meetings 12 times, and as countermeasures for COVID-19 transmission at the NRA, made adjustments such as suspension of general audiences at NRA meetings, and restrictions on attendance of staff at work and business trips, etc.

The NRA stopped admitting general audiences to meetings such as the NRA commission meetings and review meetings since the 49th FY2020 NRA Commission Meeting (January 13, 2021) in response to the state of emergency declared on January 7, 2021. Subsequently, the NRA resumed admitting general audiences from the 36th FY2021 NRA Commission Meeting (October 6, 2021) after the state of emergency was lifted on October 1, 2021.

As a rule, the NRA continued to hold face-to-face commission meetings, even when a state of emergency had been declared. However, some were held online from the 26th FY2021 NRA Commission Meeting (August 25, 2021) to the 35th FY2021 NRA Commission Meeting (September 29, 2021), given the rapid COVID-19 transmission throughout Japan in August 2021.

The NRA held others including review meetings, basically through online conferencing from the beginning of FY2021 to September 2021 during which a state of emergency or priority preventive measures to prevent the spread of disease were declared most of the time. When the state of emergency was lifted on October 1, 2021, meetings were still held online in principle. Face-to-face meetings were available, but in fact, the NRA held most meetings online afterward.

Regarding the avoidance of employees from coming to work, a target of 70% attendance was set for government employees in prefectural offices where a state of emergency or pre-emergency measures was declared. In Tokyo, the 70% target was continued from the beginning of the FY2021 to December 1, 2021. Subsequently, remote work and rotating attendance, etc. were promoted in the executable range of work with no numerical targets.

The NRA also had a policy of refraining from official trips to areas where a state of emergency or pre-emergency measures were declared or unnecessary and non-urgent trips whenever possible while making official trips required for nuclear regulatory inspections and others as usual.

2. Steadfast Promotion of Review and Inspection based on the Reactor Regulation Act

For reviews, steps were taken to minimize the impact on review work by flexibly interpreting the implementation policy for review meetings and interviews whenever possible. More specifically, the NRA steadily moved forward with reviews by conducting review meetings using an online conferencing system. The NRA received reports on the status of virtual meetings at the 3rd FY2021 NRA Commission Meeting (April 14, 2021) and the 49th FY2021 NRA Commission Meeting (December 1, 2021).

To maintain nuclear regulatory inspection functions even in the effects of COVID-19 transmission, inspections were carried out with a special work system that avoided personal contact through remote work at home and prevention of contact of staff members in the NRA Regional Offices. While routine inspections carried out mainly at the NRA Regional Offices were generally continued as initially planned, team inspections mainly conducted by inspectors dispatched from the headquarters of the Secretariat of the NRA needed to be changed due to the effect of inspectors refraining from business trips during the declaration of a state of emergency.

3. Flexible Operation of Reviews and Inspections under the Radioisotope Regulation Act

After a state of emergency had been declared in April 2020, the NRA decided at an Extraordinary Meeting of the 4th FY2020 NRA Commission Meeting (April 24, 2020), to adopt flexible operations within a reasonable scope in terms of deadlines, periods and frequencies for notifications and inspections under the Act on the Regulation of Radioisotopes, etc. (Act. No. 167 of 1957, hereinafter referred to as the "Radioisotope Regulation Act").

The abovementioned flexible operations were basically completed at the 36th FY2021 NRA Commission Meeting (October 6, 2021) after the state of emergency had been lifted.

4. Proper Implementation of National Examinations and Training

(1) Proper Implementation of National Examinations Based on the Reactor Regulation Act

For the oral examination of the 63rd Examination for Chief Engineer of Reactors in September 2021, the meeting time of examinees was set in stages as in a typical year, and admission was limited as in the previous time to avoid confusion at the examination venue. In addition to general measures such as taking temperatures, disinfecting hands and wearing masks, an online conferencing system was used to allow some examiners to participate remotely and avoid movement. Thus the examination was completed without any delay by taking appropriate measures to prevent COVID-19 transmission.

For the 54th Examination for Chief Engineer of Nuclear Fuel and the written examination of the 64th Examination for Chief Engineer of Reactors in March 2022, appropriate measures were taken to prevent COVID-19 transmission just as in FY2021 and the examinations were completed without delay.

(2) Proper Implementation of National Examinations and Periodic Training Based on the Radioisotope Regulation Act

The Radiation Protection Supervisor Examination in FY2021 was carried out normally in August by taking appropriate measures to prevent COVID-19 transmission.

Two registered organizations held the periodic training for radiation protection supervisors by taking appropriate measures to prevent COVID-19 transmission, such as the use of an online conference system.

Periodic training for Specified Radioisotope Security Managers, held by registered organizations, was also conducted with appropriate measures taken to prevent COVID-19 transmission, such as holding training sessions via e-learning.

Chapter 2 Implementation of Strict and Appropriate Nuclear Regulations and the Reinforcement of the Technology Base

○ **Summary of Chapter 2**

(Implementation of regulations relating to the Reactor Regulation Act: Review)

The NRA is conducting scientifically and technologically rigorous review—while ensuring transparency through default disclosure except when disclosure is impossible due to security issues, as in review of special facilities for severe accident management—of nuclear operators' applications for permission to change basic design in light of the new regulatory requirements established based on the lessons learned from the accident at TEPCO's Fukushima Daiichi NPS.

For commercial power reactors in FY2021, the NRA granted permission to change basic design to conform to new regulatory requirements at the Shimane NPS Unit 2 of Chugoku Electric Power Co. Inc., and approval for design and construction plans for the Onagawa NPS Unit 2 of Tohoku Electric Power Co. Inc. to conform to new regulatory requirements. With regard to the special facilities for severe accident management, persmission was granted for changes in basic design at the Tokai Daini NPS of Japan Atomic Power Co.. Design and construction plans for the second phase application (second overall) at the Mihama PS Unit 3 and the Ohi PS Units 3 and 4 of Kansai Electric Power Co., Inc. were approved. Also changes in operational safety programs at the Ikata PS Unit 3 of Shikoku Power Electric Co., Inc., the Ohi PS Units 3 and 4 and the Mihama PS Unit 3 of Kansai Electric Power Co., Inc., and the Genkai NPS Units 3 and 4 of Kyushu Electric Power Co., Inc. were approved. Approval of decommissioning plans was granted at TEPCO's Fukushima Daini NPS Units 1 to 4. To ensure transparency and predictability of review, reports for gaining an overview of progress in review of conformity with new regulatory requirements were consolidated and released once every quarter. The NRA further worked to make the review of the Tomari NPS Unit 3 of Hokkaido Electric Power Co., Inc. more comprehensible by consolidating the remaining issues to be discussed and sharing perceptions with the operator, confirming the operator's operational policy and publicly informing the operator matters to keep in mind in advance.

Regarding nuclear fuel facilities, etc., permission was granted for changes in facility operations related to the category 2 waste disposal facility of JNFL and 23 nuclear fuel material usage facilities. Regarding design and construction plans, approval was granted for all phased applications for JAEA's HTTR[5], Mitsubishi Nuclear Fuel, JAEA's STACY[6] and the uranium enrichment plant. As for changes in operational safety programs, approval was granted for JAEA's HTTR, category 2 waste disposal facility of JNFL and 18 nuclear fuel material usage facilities. Approval of decommissioning plans was granted for Toshiba NCA[7], JAEA's FCA[8] and one nuclear fuel material usage facility. To organize the status of reviews for a wide variety of nuclear fuel facilities, reports reflecting an overview of progress in review of conformity to new regulatory requirements, etc. were consolidated and released once every half year. In addition, reports on the status of review of the JNFL's reprocessing plant and MOX[9] fuel fabrication facility, and the status of decommissioning of the Tokai Reprocessing Plant of JAEA were received and released. Regarding the JAEA's Tokai Reprocessing Plant,

[5] High Temperature Engineering Test Reactor at Oarai Research and Development Institute (North Area), JAEA

[6] Static Experiment Critical Facility at the Nuclear Science Research Institute of JAEA (STACY)

[7] Toshiba Nuclear Critical Assembly (NCA) of Toshiba Energy Systems

[8] Fast critical assembly (FCA) at the Nuclear Science Research Institute , JAEA

[9] Mixed-oxide fuel

monitoring will continue to ensure that safety measures and vitrification are steadily implemented with early reduction of risks such as radioactive wastewater, etc. in the plant as the top priority.

Regarding the "backfitting" that requires the introduction of the latest scientific and technological knowledge into the regulatory requirements and conformance of existing nuclear facilities, reviews were continued for responses to toxic gas protection, revised scale of Daisen-Namatake tephra eruption from Daisen Volcano and tsunamis that may not be accompanied by tsunami warnings, and permissions and approvals were granted. Regarding the introduction of standard response spectrum into the regulations, related regulations were revised in April 2021 to proceed with the review of permission to change basic design, and make decisions on the necessity of changing the design basis ground motion.

(Implementation of regulations relating to the Reactor Regulation Act: Inspection)

Since April 2020, the NRA has been conducting nuclear regulatory inspections that combine routine and team inspections under the new inspection system. In May 2021, the comprehensive assessment of the first fiscal year (FY2020) was conducted, and TEPCO's Kashiwazaki-Kariwa NPS was evaluated as having a long-term or serious deterioration in safety and security activities and an increased number of baseline inspections and supplemental inspections were planned in FY2021. Other nuclear facilities were evaluated as being in a state at which autonomous improvements can be expected. Continuation of regular baseline inspections was planned in FY2021.

In the nuclear regulatory inspections up to the third quarter of FY2021, there were 26 inspection findings, all with a significance of "green" (no additional action for nuclear fuel facilities, etc.) and a severity level of "SLIV." In FY2021, there were 54 cases of statutory confirmation, and 23 cases of pre-service inspections, etc. according to the interim measures for the revision of the Reactor Regulation Act.

Regarding the fault on the premises of the Tsuruga NPS Unit 2 of Japan Atomic Co., which was discovered in 2020, the incident in which the description of the boring log to confirm the validity of evaluation of the continuity directly under the important facility was deleted or changed without explanation was also confirmed continuously in FY2021 through nuclear regulatory inspections. When remedial actions such as revision of internal regulations of Japan Atomic Power Co. are completed and review materials prepared, the Secretariat of the NRA plans to conduct inspections again in future.

Regarding the unauthorized use of an ID card and the partial loss of function of the physical protection equipment at TEPCO's Kashiwazaki-Kariwa NPS, discovered in FY2020, the NRA issued an order to take corrective measures pursuant to the Nuclear Reactor Regulation Act on April 14, 2021. From April 2021, supplemental inspections, consisting of detailed investigation of facts (Phase I), confirmation of improvement status of corrective actions (Phase II), and confirmation of responses to inspection findings as necessary during the confirmation of the operation status (Phase III), have been determined. Phase II inspection is currently being carried out. On April 27, 2022, the NRA received a report on the interim summary of inspection results thus far, and agreed on ways to promote further supplemental inspections, including matters requiring actions by TEPCO and perspectives of their evaluation in confirming the implementation status of corrective action plans. According to that policy, the NRA will proceed with supplemental inspections focusing on the implementation status of corrective action plans and their effects in future.

(Promotion of Safety Research and Continuous Improvement of Regulatory Requirements)

In FY2021, 23 safety research projects were implemented in 14 research areas. For achievements in safety research, the NRA published 1 NRA technical report, 4 NRA technical notes and 22 papers in journals. Additionally, there were 8 papers presented at international conferences, 32 academic presentations, and 2 academic awards received in FY2021.

In the evaluation of safety research, the NRA conducted post-evaluations of seven safety research projects that ended in FY2020 and pre-evaluations of two safety research projects starting in FY2022, and – as safety research policies – formulated the "Safety Research Field to be Promoted and its Enforcement Policy (for safety research to be conducted in and after FY2022)." The NRA also made bilateral information exchanges, and participated in 19 international joint research projects at OECD/NEA and 11 meetings under OECD/NEA/CSNI to collect technical knowledge including the latest trends in each research field. Additionally, the NRA conducted 20 joint research projects with universities, etc., and reviewed the safety research implementation system, including a plan to conduct radiation protection research by technology base group after FY2022.

For continuous improvements in regulatory requirements, various requirements and criteria were steadily developed, including the development of regulatory requirements, etc. for seismic isolation of buildings and structures, development of regulatory requirements, etc. related to category 2 waste disposal facilities, development of judgment criteria for confirming the completion of decommissioning of nuclear facilities, formulation of decommissioning approval criteria for usage facilities, and consideration related to the introduction of the knowledge obtained from the "Interim Summary of Investigation and Analysis of TEPCO's Fukushima Daiichi NPS Accident" into the regulations, etc. Regulatory requirements were revised to reflect review experience and past records, and studies relating to continuous safety improvement were also promoted. In addition, technical evaluations of codes and standards, as well as collection and analyses of information on domestic accidents, troubles and natural phenomena were included in these activities.

(Steadfast Implementation of the Revised Reactor Regulation Act)

For continuous improvement of the nuclear regulatory inspection system, which started in April 2020, the "Information Exchange Meeting on the Inspection Program" was held three times in FY2021 to exchange views with external experts and nuclear operators.

In response to the delay in reporting the ID card fraud at TEPCO's Kashiwazaki-Kariwa NPS from the Secretariat of the NRA, the operation was revised to report the possibility of inspection findings immediately to the NRA chairman, etc. In addition to inspections related to nuclear facility safety and radiation safety, operations were also changed so that the inspectors of the NRA Regional Offices inspect the status of physical protection and patrol the site. The "public meeting to investigate and analyze the cause of the rewriting of borehole map data at Tsuruga NPS Unit 2" was held twice, and called for the participation of nuclear operators as necessary to check the facts noticed during inspections.

Regarding the enhancement of the quality management system based on the Act for Partial Revision of the Reactor Regulation Act, which came into force on April 1, 2020, the NRA verified the details of the permission for and notification of change from 231 nuclear fuel facilities and granted approval of and approval of changes in operational safety programs for 39 facilities.

Section 1 Implementation of Regulations Relating to the Reactor Regulation Act

1. Implementation of Review on Conformity to New Regulatory Requirements of Commercial Power Reactors

As for commercial power reactors, since the NRA enforced new regulatory requirements on July 8, 2013, 11 nuclear operators submitted applications for permission to change basic design to conform to new regulatory requirements for 27 plants at 16 nuclear power stations, and permission was granted for 16 plants at 9 nuclear power stations of 6 operators by FY2020. The applications are strictly and adequately reviewed based on the policies approved by the NRA. 76 review meetings were held in FY2021. To ensure transparency and predictability of review, reports for gaining an overview of progress in review of conformity with new regulatory requirements were consolidated, delivered to the NRA, and released on the NRA website once every quarter. The NRA further worked to make the review of Unit 3 of the Tomari NPS of Hokkaido Electric Power Co., Inc. more comprehensible by consolidating the remaining issues to be discussed and sharing perceptions with the operator, confirming the operator's operational policy and publicly informing the operator matters to keep in mind in advance.

(1) Review of Main Facility

Many discussions centered on issues such as design basis ground motion and design basis tsunami, preventive design for tornadoes, internal overflows and internal fire, the evaluation of effectiveness of measures for severe accidents such as preventing core damage and breakage of containment vessels, and the preparation of procedures for serious accidents.

Regarding the Shimane NPS Unit 2 of Chugoku Electric Power Co., Inc., after the application for permission to change basic design to conform to new regulatory requirements was reviewed, scientific and technological views concerning a draft review report addressing the technical capability of the operator and the structure and equipment of the reactor were collected as reference for comparison. Views of the AEC Commissioners and Minister of METI were also collected pursuant to the provisions of the Reactor Regulation Act. Based on these, permission was granted for changes in basic design at the 32nd FY2021 NRA Commission Meeting (September 15, 2021).

On December 23, 2021, approval was granted for design and construction plans at the Onagawa NPS Unit 2 of Tohoku Electric Power Co., Inc. to conform to new regulatory requirements.

(2) Review of Special Facilities for Severe Accident Management

Applications for permission to change basic design were submitted by 9 nuclear operators for 19 plants at 12 nuclear power stations, and permission was granted for 12 plants at 6 nuclear power stations of 3 nuclear operators by FY2020. In the review of these applications, the NRA checked whether measures had been taken to ensure that necessary functions were not impaired in the event of large-scale incidents due to intentional large-aircraft crashes or other acts of terrorism. Regarding the Tokai Daini NPS of Japan Atomic Power Co., the change in basic design was approved at the 54th FY2021 NRA Commission Meeting (December 22, 2021). On January 6, 2022, the NRA received an application for permission to change basic design at the Onagawa NSP Unit 2 of Tohoku Electric Power Co., Inc.

Applications for approval of design and construction plans have been submitted so far from 4 nuclear operators for 13 plants at 7 nuclear power stations, and approval was granted for 9 plants at 4 nuclear power stations of three operators, including Kansai Electric Power Co., Inc. for the Mihama PS Unit 3 on April 6, 2021, and for the second phase application (two times overall) for the Ohi PS Units 3 and 4 on August 24, 2021, respectively. As for the Tokai Daini NSP of the Japan Atomic Power Co., the first phase application (four times overall) for the approval of design and construction plans was received on February 28, 2022.

Applications for approval to change operational safety programs were submitted by 3 nuclear operators for 10 plants at 6 nuclear power stations, and approval was granted for 4 plants at 2 nuclear power stations of 2 nuclear operators. The change in operational safety programs was approved for the Ikata NPS Unit 3 of Shikoku Electric Power Co., Inc. on April 28, 2021, Genkai NPS Units 3 and 4 of Kyushu Electric Power Co., Inc. and Ohi PS Units 3 and 4 of Kansai Electric Power Co., Inc. on March 24, 2022, and Mihama PS Unit 3 of Kansai Electric Power Co., Inc. on March 25, 2022.

(3) Review of Protection against Noxious Gases[10]

Applications for permission to change basic design to incorporate protection against noxious gases in main facilities have been submitted so far for 16 plants at 9 nuclear power stations of 6 nuclear operators, and permission was granted for 15 plants at 8 nuclear power stations of 5 nuclear operators by FY2020. In FY2021, permission was granted for one plant at one nuclear power station of one nuclear operator.

Applications for permission to change basic design concerning protection against noxious gases in special facilities for severe accident management have been submitted so far for 16 plants at 9 nuclear power stations of 6 operators, and in FY2020, approval was granted to 12 plants at 6 nuclear power stations of 3 operators.

Applications for approval of design and construction plans relating to protection against noxious gases in main facilities have been submitted so far for 14 plants at 8 nuclear power stations of 5 operators, and approval was granted for 13 plants at 7 nuclear power stations of 4 operators by FY2020. Applications for design and construction plans to incorporate protection against noxious gases in special facilities for severe accident management have been submitted so far for 12 plants at 6 nuclear power stations of 3 operators, and approval was granted for 7 plants at 4 nuclear power stations of 3 operators by FY2020. In FY2021, approval was granted for 5 plants at 3 nuclear power stations of one operator.

Applications for permission to change operational safety programs relating to protection against noxious gases in main facilities have been submitted so far for 4 plants at 7 nuclear power stations of 4 operators, and approval was granted for 4 plants at 2 nuclear power stations of 2 operators by FY2020. Regarding changes in operational safety programs to incorporate protection against noxious gases in special facilities for severe accident management, applications have been submitted so far for 10 plants at 6 nuclear power stations of 3 operators, and approval was granted for 6 plants at 4 nuclear power stations of 3 operators in FY2021.

[10] Including applications for permission to conform to new regulatory requirements or for the installation of special facilities for severe accident management. The same applies to the applications for permission of design and construction plans and changes to the operational safety programs in this section.

(4) Regulatory Response to Review on Eruption Scale of Daisen-Namatake Tephra from Daisen Volcano

On September 26, 2019, the NRA received an application for permission to change basic design at the Ohi PS Units 3 and 4, the Takahama PS Units 1 to 4 and Mihama PS Unit 3 of Kansai Electric Power Co., Inc. in relation to the review of the scale of the Daisen-Namatake tephra eruption from Daisen Volcano. The conformity of nuclear plants to new regulatory requirements was examined at a review meeting, and scientific and technological views concerning the draft review report were collected as reference for comparison. Views of the AEC Commissioners and Minister of MEXT were also collected pursuant to the provisions of the Reactor Regulation Act. Based on these, permission was granted for changes in basic design at the 8th FY2021 NRA Commission Meeting (May 19, 2021). On July 1, 2021, the NRA received applications from Kansai Electric Power Co., Inc. for approval of design and construction plans at the Ohi PS Units 3 and 4, the Takahama PS Units 1 to 4, and the Mihama PS Unit 3, and applications for permission to change operational safety programs for the Ohi PS and Takahama PS[11]. Approval was granted for design and construction plans at the Takahama PS Units 3 and 4 on February 15, 2022, and at the Ohi PS Units 3 and 4, Takahama PS Units 1 and 2, and Mihama PS Unit 3 on March 4, 2022, and changes in operational safety programs at the Ohi PS and Takahama PS on April 7, 2022. With this, the review of the eruption scale of the Daisen-Namatake tephra from Daisen Volcano was completed.

(5) Countermeasures for Tsunamis that May Not Be Accompanied by Tsunami Warnings

Regarding tsunamis that may not be accompanied by tsunami warnings, the NRA has reviewed the application for approval to change design and construction plans for the installation of special facilities for severe accident management at the Takahama PS Units 1 and 2, received from Kansai Electric Power Co., Inc. on July 2, 2021, following permission to change basic design, approval of design and construction plans, and approval to change operational safety programs by FY2020.

(6) Introduction of Standard Response Spectrum into Regulations

At the 24th FY2019 NRA Commission Meeting (August 28, 2019), the NRA decided to introduce standard response spectrum for ground motions evaluated without specifying seismic sources (nationwide) into the regulations. Thereafter, the revision policy, etc. was discussed several times, and through public comment procedures, rule interpretations were revised at the 5th FY2021 NRA Commission Meeting (April 21, 2021). It was also decided that application for permission must be submitted within 9 months as a post-revision procedure, but if the operator considers that the design basis ground motion need not be changed for specific nuclear facilities, a document explaining it can be submitted within 3 months, and if the NRA deems it unnecessary, the application is not required.

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[11] On the same day, the NRA received applications from Kansai Electric Power Co., Inc. for permission to change the design and construction plans for the installation of special facilities for severe accident management for the Mihama PS Unit 3 and Takahama PS Units 1 and 2, and on September 6 2021, for the Ohi PS Units 3 and 4. Approval was granted for all of these applications on March 4, 2022.

Afterwards, applications for permission to change basic design were submitted from Kyushu Electric Power Co., Inc. for the Sendai NPS Units 1 and 2, Japan Atomic Power Co. for the Tokai Daini NPS, Shikoku Electric Power Co. Inc. for the Ikata NPS Unit 3 and Kyushu Electric Power Co. Inc. for the Genkai NPS Units 3 and 4. All are under examination at the review meeting.

Documents explaining non-requirement for a change in design basis ground motion were submitted from Kyushu Electric Power Co., Inc. for the Genkai NPS Units 3 and 4, TEPCO for the Kashiwazaki-Kariwa NPS Units 6 and 7, Kansai Electric Power Co., Inc. for the Ohi PS Units 3 and 4, Takahama PS Units 1 to 4, and Mihama PS Unit 3, Tohoku Electric Power Co., Inc. for the Onagawa NPS Unit 2, and Chugoku Electric Power Co., Inc. for the Shimane NPS Unit 2. After discussions at public review meetings, the NRA decided on the validity of these applications. Accordingly, non-requirement for a change in design basis ground motion was approved with the exception of the Genkai NPS Units 3 and 4 of Kyushu Electric Power Co., Ltd. Regarding Units 3 and 4 of the Genkai NPS of Kyushu Electric Power Co., Inc., non-requirement for a change in design basis ground motion was not judged to be approvable, and therefore, an application for permission to change basic design was filed from Kyushu Electric Power Co., Inc.

(7) Status of Review Concerning Approval of Decommissioning Plans

Applications for approval of decommissioning plans have been submitted from 7 operators for 15 plants at 8 nuclear power stations from the launch of the NRA in 2012 up until now, and approval was granted to 6 operators for 11 plants at 7 nuclear power stations by FY2020. In FY2021, approval of decommissioning plans was granted to TEPCO for the Fukushima Daini NPS Units 1 to 4 at the 6th FY2021 NRA Commission Meeting (April 28, 2021).

The application was submitted form Kansai Electric Power Co., Inc. on July 29, 2021 for approval to change specific details of decommissioning plans for the second and subsequent phases of the decommissioning at Units 1 and 2 of the Mihama PS, and approval was granted at the 73rd FY2021 NRA Commission Meeting (March 23, 2022).

Table 2-1 Status of the Reviews and Inspections of Commercial Power Reactors Concerning Conformity to New Regulatory Requirements

○ Commercial power reactors

No.	Applicant	Targeted power reactor			New Regulatory Requirements Conformity Review			Pre-service check, etc*1
					Permission of change in basic design	Approval of construction plan	Approval of operational safety program	
1	Japan Atomic Power Comoany	Tokai Daini NPS		BWR	Completed	Completed	Under review	Under inspection
2		Tsuruga NPS	Unit 2	PWR	Under review	Not applied	Under review	
3	Electric Power Development Co., Ltd.	Ohma NPS		Under construction	Under review	Under review	Not applied	
4	Hokkaido Electric Power Co., Inc.	Tomari NPS	Unit 1	PWR	Under review	Under review	Under review	
5			Unit 2	PWR	Under review	Under review	Under review	
6			Unit 3	PWR	Under review	Under review	Under review	
7	Tohoku Electric Power Co., Inc.	Higashidori NPS		BWR	Under review	Under review	Under review	
8		Onagawa NPS	Unit 2	BWR	Completed	**Completed**	Under review	**Under inspection**
9			Unit 3	BWR	Not applied	Not applied	Not applied	
10	TEPCO Holdings	Higashidori NPS		Under construction	Not applied	Not applied	Not applied	
11		Kashiwazaki Kariwa NPS	Unit 1	BWR	Not applied	Not applied	Not applied	
12			Unit 2	BWR	Not applied	Not applied	Not applied	
13			Unit 3	BWR	Not applied	Not applied	Not applied	
14			Unit 4	BWR	Not applied	Not applied	Not applied	
15			Unit 5	BWR	Not applied	Not applied	Not applied	
16			Unit 6	BWR	Completed	Under review	Not applied	
17			Unit 7	BWR	Completed	Completed	Completed	Under inspection
18	Chubu Electric Power Co., Inc.	Hamaoka NPS	Unit 3	BWR	Under review	Not applied	Not applied	
19			Unit 4	BWR	Under review	Under review	Under review	
20			Unit 5	BWR	Not applied	Not applied	Not applied	
21	Hokuriku Electric Power Co., Inc.	Shika NPS	Unit 1	BWR	Not applied	Not applied	Not applied	
22			Unit 2	BWR	Under review	Under review	Under review	
23	Knasai Electric Power Co., Inc.	Mihama NPS	Unit 3	PWR	Completed	Completed	Completed	**Completed**
24		Ohi NPS	Unit 3	PWR	Completed	Completed	Completed	Completed
25			Unit 4	PWR	Completed	Completed	Completed	Completed
26		Takahama NPS	Unit 1	PWR	Completed	Completed	Completed	Under inspection
27			Unit 2	PWR	Completed	Completed	Completed	Under inspection
28			Unit 3	PWR	Completed	Completed	Completed	Completed
29			Unit 4	PWR	Completed	Completed	Completed	Completed
30	Chugoku Electric Power Co., Inc.	Shimane NPS	Unit 2	BWR	**Completed**	Under review	Under review	
31			Unit 3	Under construction	Under review	Not applied	Not applied	
32	Shikoku Electric Power Co., Inc.	Ikata NPS	Unit 3	PWR	Completed	Completed	Completed	Completed
33	Kyushu Electric Power Co., Inc.	Genkai NPS	Unit 3	PWR	Completed	Completed	Completed	Completed
34			Unit 4	PWR	Completed	Completed	Completed	Completed
35		Sendai NPS	Unit 1	PWR	Completed	Completed	Completed	Completed
36			Unit 2	PWR	Completed	Completed	Completed	Completed

(Notes) Power reactors, whose decommissioning plans have been approved or whose decommissioning has been announced by the nuclear operator, are excluded

*1) Including pre-service inspections pursuant to Article 7-1 of Supplementary Provisions of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material, and Reactors for Strengthening Safety Measures in the Use of Nuclear Power (Act No. 15 of 2017).

Nuclear power stations whose status changed in FY2021

Table 2-2 Status of the Reviews and Inspections of Commercial Power Reactors Concerning Conformity to New Regulatory Requirements (Special Facilities for Severe Accident Management)

○ Commercial power reactors (Special Facilities for Severe Accident Management)

No.	Applicant	Targeted power reactor			New Regulatory Requirements Conformity Review			Pre-service check, etc*1
					Permission of change in basic design	Approval of construction plan	Approval of operational safety program	
1	Electric Power Development Co., Ltd.	Ohma NPS		Special Facility	Under review			
2	Japan Atomic Power Comoany	Tokai Daini NPS		Special Facility	**Completed**	**Under inspection**		
3	Hokkaido Electric Power Co., Inc.	Tomari NPS	Unit 3	Special Facility	Under review			
4	TEPCO Holdings	Kashiwazaki Kariwa NPS	Unit 6	Special Facility	Under review			
5			Unit 7	Special Facility	Under review			
6	Knasai Electric Power Co., Inc.	Mihama NPS	Unit 3	Special Facility	Completed	**Completed**	**Completed**	**Under inspection**
7		Ohi NPS	Unit 3	Special Facility	Completed	**1st time: Completed 2nd time: Completed**	**Completed**	**Under inspection**
8			Unit 4	Special Facility	Completed	**2nd time: Completed 2nd time: Completed**	**Completed**	**Under inspection**
9		Takahama NPS	Unit 1	Special Facility	Completed	Completed		Under inspection
10			Unit 2	Special Facility	Completed	Completed		Under inspection
11			Unit 3	Special Facility	Completed	Completed	Completed	Completed
12			Unit 4	Special Facility	Completed	Completed	Completed	Completed
13	Chugoku Electric Power Co., Inc.	Shimane NPS	Unit 2	Special Facility	Under review			
14	hikoku Electric Power Co., Inc.	Ikata NPS	Unit 3	Special Facility	Completed	Completed	**Completed**	**Completed**
15	Kyushu Electric Power Co., Inc.	Genkai NPS	Unit 3	Special Facility	Completed	1st time: Completed 2nd time: Completed 3rd time: Completed	**Completed**	Under inspection
16			Unit 4	Special Facility	Completed	2nd time: Completed 2nd time: Completed 3rd time: Completed	**Completed**	Under inspection
17		Sendai NPS	Unit 1	Special Facility	Completed	Completed	Completed	Completed
18			Unit 2	Special Facility	Completed	Completed	Completed	Completed
19	Tohoku Electric Power Co., Inc.	Onagawa NPS	Unit 2	Special Facility	**Under inspection**			

(Notes) Power reactors, whose decommissioning plans have been approved or whose decommissioning has been announced by the nuclear operator, are excluded

*1) Including pre-service inspections pursuant to Article 7-1 of Supplementary Provisions of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material, and Reactors for Strengthening Safety Measures in the Use of Nuclear Power (Act No. 15 of 2017).

Nuclear power stations whose status changed in FY2021

2. Implementation of Review of Aging Management System for Commercial Power Reactors

The aging management system requires an assessment of degradation of equipment and structures and development of a long-term facility maintenance policy for commercial power reactor facilities that have been operated for more than 30 years. This must take place every 10 years and the results need to be reflected in the operational safety programs.

In FY2021, approval was granted for the change in operational safety programs relating to the technical assessment of aging management (30th years) for Unit 3 of the Ohi PS of Kansai Electric Power Co., Inc. as the plant to be assessed on the premise that it is in operation at the 47th FY2021 NRA Commission Meeting (November 24, 2021). Another application was submitted on December 3, 2021 for approval to change operational safety programs for Unit 4 of the same power station relating to the technical assessment of aging management (30th year).

3. Proper Implementation of a System for Evaluation of Safety Improvement

In FY2021, notifications requesting evaluations of safety improvements were filed for the Sendai NPS Unit 1 of Kyushu Electric Power Co., Inc. (June 15, 2021), Genkai NPS Unit 3 of Kyushu Electric Power Co., Inc. (June 22, 2021), Sendai NPS Unit 2 of Kyushu Electric Power Co., Inc. (July 26, 2021), Ohi PS Unit 4 of Kansai Electric Power Co., Inc. (August 6, 2021), Takahama PS Unit 3 of Kansai Electric Power Co., Inc. (October 6, 2021), Genkai NPS Unit 4 of Kyushu Electric Power Co., Inc. (October 15, 2021), Takahama PS Unit 4 of Kansai Electric Power Co., Inc. (November 15, 2021), and Ohi PS Unit 3 of Kansai Electric Power Co., Inc. (January 31, 2022). The NRA confirmed the specifics of these notifications in accordance with the operational guidelines for the evaluation of safety improvements in commercial power reactors.

At a meeting on continuous improvements in the evaluations of safety improvement for commercial nuclear power reactors, the NRA heard opinions on and discussed efforts for continuous improvements in the evaluations of safety improvement by operators. At the 12th FY2021 NRA Commission Meeting (June 9, 2021), the NRA received a report from the Secretariat of the NRA on the results of exchanging opinions with operators about handling of special facilities for severe accident management in the evaluation of safety improvement.

4. Status of Review on Type Certification, etc. of Specified Equipment Design related to Nuclear Power Reactor Facilities

Regarding the review of type certifications, etc. of specified equipment design related to nuclear power reactor facilities, a review system was established at the 3rd FY2020 NRA Commission Meeting (April 22, 2020). The type certification, etc. for the design of specific dual-use casks[12] has been reviewed at the relevant review meetings.

In FY2021, the application for type certification from Mitsubishi Heavy Industries, Ltd. was approved at the 41st FY2021 NRA Commission Meeting (October 27, 2021), and that from Hitachi-GE Nuclear Energy, Ltd. at the 62nd FY2021 NRA Commission Meeting (January 26, 2022).

[12] Specified equipment stipulated in Article 100-2 of the Regulations Concerning the Installment, Operation, etc. of Practical Generation Reactors (The Ministry of International Trade and Industry Order No. 77 of 1978) and also used as cask, and meets the provisions of Article 4-6 (i), Article 5-2 (i), and Article 6-4 (i) of the NRA Rule on Standards for the Location, Structure, and Equipment of Commercial Power Reactors (NRA Rule No. 5 of 2013) (those that maintain safety functions against uniform site-independent seismic forces, tsunamis and tornadoes).

5. Implementation of Conformity Review to New Regulatory Requirements and Inspections of Nuclear Fuel Cycle Facilities, etc.

(1) Status of Review for Conformity with New Regulatory Requirements

As for nuclear fuel cycle facilities, etc., applications for permission to change facility operations have been submitted by 9 operators for 21 facilities so far since the enactment of new regulatory requirements in December 2013, and permission was granted for 18 facilities of 8 operators by FY2020. Reviews have been conducted based on "Conducting Conformity Reviews of Facilities for Handling Nuclear Fuel Materials after the Enactment of New Regulatory Requirements" (adopted on December 25, 2013 and partially amended on June 1, 2016 and April 25, 2018), and a total of 36 review meetings were held in FY2021. To sort out the status of reviews for a wide variety of nuclear fuel cycle facilities, reports for gaining an overview of progress in review of conformity to new regulatory requirements were consolidated and released once every half year.

Regarding category 2 waste disposal facilities of the JNFL, the NRA reviewed an application for permission to change facility operations for the expansion of No. 3 disposal facility, compiled draft review results at the 15th FY2021 NRA Commission Meeting (June 23, 2021), collected opinions from the Minister of METI based on the provisions of the Reactor Regulation Act, and granted permission to change facility operations at the 21st FY2021 NRA Commission Meeting (July 21, 2021). In FY2021, permission was granted for a total of 23 nuclear fuel material usage facilities at the Nuclear Science Research Institute of JAEA, etc.

Regarding the approval of design and construction plans, the NRA reviews according to the "Conducting Review of Approval of Design and Construction Plans, and Checking of Pre-Service Operator Inspections, relating to Reprocessing Facilities of Japan Nuclear Fuel Limited" agreed at the 12th FY2020 NRA Commission Meeting (June 24, 2020) and "Conducting Review of Approval of Design and Construction Plans, and Pre-Service Checking, relating to Research Reactor Facilities and Nuclear Fuel Cycle Facilities" agreed at the 28th FY2020 NRA Commission Meeting (September 30, 2020). In FY2021, approval was granted for the fourth phase application (four times overall) for the High Temperature Engineering Test Reactor (HTTR) at the Oarai Research and Development Institute (North Area) of the JAEA on April 8, 2021, and approval for all phases was completed. Approval was also granted for the seventh phase application (seven times overall) for Mitsubishi Nuclear Fuel Co., Ltd. on June 1, 2021, and approvals for all phases were completed. Approval was granted for the eighth phase application (eight times overall) for the Static Experiment Critical Facility (STACY) at the Nuclear Science Research Institute of JAEA on July 29, 2021, and approvals for all phases were completed. Approval was granted for the fourth phase and fifth phase applications (five times overall) for the uranium enrichment facility of the JNFL on July 26, 2021 and February 4, 2022, respectively, and approvals for all phases were completed.

The NRA received a report on "the Status of Review on Applications for the Approval of Design and Construction Plans for the Reprocessing Plant and MOX Facility of JNFL" at the 32nd FY2021 NRA Commission Meeting (September 15, 2021) to clarify the status of review on the reprocessing plant and MOX fuel fabrication facility of the JNFL. The NRA also received a report on "the Status of Pre-service Operator Inspections and

Confirmation of the Integrity of Embedded Hardware at the Reprocessing Plant of Japan Nuclear Fuel Limited" at the 28th FY2021 NRA Commission Meeting (September 1, 2021) to comprehensively understand the feasibility of pre-service operator inspections, including those areas that are inaccessible due to active testing.

Approval was granted for operational safety programs for the High Temperature Engineering Test Reactor (HTTR) at the Oarai Research and Development Institute (North Area) of the JAEA on April 16, 2021, and the category 2 waste disposal facility of the JNFL on September 7, 2021. A total of 18 approvals were granted in FY2021 for nuclear fuel material usage facilities including the Nuclear Fuel Cycle Engineering Laboratories of the JAEA.

Approval of decommissioning plans was granted for the Toshiba Nuclear Critical Assembly (NCA) of Toshiba Energy Systems at the 6th FY2021 NRA Commission Meeting (April 28, 2021), and for the Fast Critical Assembly (FCA) at the Nuclear Science Research Institute of the JAEA at the 35th FY2021 NRA Commission Meeting (September 29, 2021). Approval was also granted for Radia Industry Co., Ltd., which is a nuclear fuel material usage facility, on August 18, 2021.

Regarding approvals for packaging design, and type certification and designation for design of specified containers related to spent fuel storage facility, a total of six review meetings were held in FY2021 to discuss shipping containers and other specified containers for spent fuel storage facility. Four approvals were granted for packaging design, four approvals for packaging, one approval for type certification for a design of specified containers related to spent fuel storage facility, and one approval for type designation.

(2) Actions Taken for Introducing Standard Response Spectrum into Regulations

As described previously in 1.(6), rule interpretations were revised at the 5th FY2021 NRA Commission Meeting (April 21, 2021).

Thereafter, applications for permission to change basic design (approvedal) or permission to change facility operations were submitted from the JAEA for the High Temperature Engineering Test Reactor (HTTR) at the Oarai Research and Development Institute (North Area), Kyoto University for the Kyoto University Research Reactor (KUR), JNFL for the reprocessing facility, the MOX fuel fabrication and waste management facilities, and Recycled-Fuel Storage Co. for the spent fuel storage facility. These are currently being discussed at review meetings.

For the reactor facility (JRR-3) at the Nuclear Science Research Institute of the JAEA, a document explaining non-requirement for a change in design basis ground motion was submitted, and after discussions at a public review meeting, the NRA decided the validity of this application. Accordingly, non-requirement for a change in design ground motion was approved.

Table 2-3 Status of Reviews and Inspections Concerning Conformity to New Regulatory Requirements

○ Commercial oower reactors

No.	Applicant	Targeted power reactor	New Regulatory Requirements Conformity Review			Pre-service check, etc.*4
			Permission of change in basic design/facility operation	Approval of design and construction plan	Approval of operational safety program	
1	Japan Nuclear Fuel Ltd.	Reprocessing facility	**Completed**	Under review	Not applied	
2		MOX fuel fabrication facility	**Completed**	Under review	Not applied	
3		Uranium Enrichment Facility	**Completed**	**Completed**	Not applied	Under inspection
4		Waste Storage Facility	**Completed**	Not applied	Not applied	
5		Waste Disposal Facility*5	**Completed**		**Completed**	
6	Recyclable-Fuel Storage Company	Spent fuel Fabrication Facility	**Completed**	Under review	Not applied	**Under inspection**
7	Mitsubishi Nuclear Fuel	Uranium Fuel Fabrication Facility	**Completed**	**Completed**	Under review	Under inspection
8	Japan Atomic Energy Agency	Waste Storage Facility	**Completed**	Under review	Under review	Under inspection
9		Research reactor facility (JRR-3)	**Completed**	**Completed**	**Completed**	**Completed**
10		Research reactor facility (HTTR)	**Completed**	**Completed**	**Completed**	**Completed**
11		Research reactor facility (Common radioactive waste disposal facility)	**Completed**	Under review	Not applied	Under inspection
12		Research reactor facility (NSSR)	**Completed**	**Completed**	**Completed**	**Completed**
13		Research reactor facility (STACY)	**Completed**	**Completed**	Not applied	Under inspection
14		Research reactor facility (Joyo)	Under review	Not applied	Under review	
15	Nuclear Fuel Industries, Ltd	Uranium Fuel Fabrication (Tokai Works)	**Completed**	Under review	Not applied	Under inspection
16		Uranium Fuel Fabrication (Kumatori Works)	**Completed**	Under review	Not applied	Under inspection
17	Global Nuclear Fuel Japan	Uranium Fuel Fabrication Facility	**Completed**	Under review	Not applied	Under inspection
18	Kyoto University	Research reactor facility (KUR)	**Completed**	**Completed**	**Completed**	**Completed**
19		Uranium Fuel Fabrication Facility (KUCA)	**Completed**	**Completed**	**Completed**	**Completed**
20	Kindai University	Research reactor facility (Kindai Univecrsity Nuclear Reactor)	**Completed**	**Completed**	**Completed**	**Completed**
21	Japan Atomic Power Company	Category 2 waste disposal facility (trench disposal)	Under review		Not applied	

*1) •Nuclear fuel facilities, whose decommissioning plans have been approved or whose decommissioning has been announced by the nuclear operator, are excluded.
•This shall not preclude implementation of activities other than “those that greatly increase facility risk or that reduce facility risk” only for 5 years (refer to “Policies on the Application of New Regulatory Requirements to Nuclear Fuel Facilities” enacted by the Secretariat of the NRA on November 6, 2013).

*2) Regarding phased applications for permission to change design and construction plans, the review shall continue until the final application is approved

*3) Regarding the review of permission to change operational safety programs, no application is assumed to be filed when only part of an application is submitted.

*4) Including pre-service inspections pursuant to Article 7-1 of Supplementary Provisions of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material, and Reactors for Strengthening Safety Measures in the Use of Nuclear Power (Act No. 15 of 2017).

*5) Waste burial is underway at facilities that have completed the confirmation of waste disposal stipulated in Article 51-6, item 1 of the Reactor Regulation Act.

Nuclear power stations whose status changed in FY2021

6. Actions Taken for Decommissioning of the Prototype Fast Breeder Reactor MONJU

In January 2017, the NRA set up the Safety Oversight Team for Prototype Fast Breeder Reactor MONJU Decommissioning to continuously check the state of MONJU of JAEA and ensure the safety of decommissioning steps. Five meetings of the Oversight Team were held in FY2021.

The work for removing fuel from the core, etc. started in August 2018 as described in the decommissioning plan approved at the 75th FY2017 NRA Commission Meeting (March 28, 2018), and the Oversight Team has been keeping close watch on the progress of work and heard the state of investigation into decommissioning issues. In FY2021, the JAEA began transferring fuel from the ex-core fuel storage tank to the fuel pond on May 19, 2021 and completed the planned transfer of 146 fuel assemblies on July 25, 2021. So far, 246 fuel assemblies have been taken out from the core and transferred to the ex-core fuel storage tank, and 406 fuel assemblies moved from the storage tank to the fuel pond.

7. Actions Taken for Decommissioning of Tokai Reprocessing Plant

The NRA set up the Safety Oversight Term for Tokai Reprocessing Plant and Other Facilities in January 2016 to regularly confirm the status of implementation of vitrification for risk reductions at the Tokai Reprocessing Plant, the safety of the facility, and approaches to ensure safety for decommissioning. At the 4th FY2019 NRA Commission Meeting (April 17, 2019), the JAEA Back-end Measure Oversight Team[13] was separated from the Safety Oversight Team. The issues concerning decommissioning of the Tokai Reprocessing Plant have been continually checked by the reorganized Safety Oversight Team for the Tokai Reprocessing Plant (hereinafter referred to as the "Oversight Team"). Eight meetings of the Oversight Team were held in FY2021.

Regarding decommissioning of the Tokai Reprocessing Plant, with the reduction of the risk of radioactive waste liquid, etc. in hand as the immediate priority, it is necessary to proceed with the work to include safety measures (hereafter referred to as "safety measures" in (1) and (2) below) for highly radioactive waste liquid and vitrification.

(1) Status of Implementation of Safety Measures

Application for approval to change the decommissioning plan related to the formulation of safety measures was filed in five installments from December 2019 to December 2021. Among the application, the development of systems and equipment to deal with evaporation to dryness which is a type of accident assumed during decommissioning at the high-activity waste storage facilities (HAW) and the Tokai Vitrification Facility (TVF), and measures for design ground motion and design tsunami for decommissioning plans are indicated.

On March 3, 2022, the NRA completed the approval of the decommissioning plan related to the formulation of safety measures, and confirmed that HAW and TVF are capable of maintaining the accident response implementation system using portable

[13] A team dealing with the comprehensive issues on the backend measures of the JAEA.

accident response equipment, etc. for seven days without relying on external support, and that supplemental safety measures including earthquake and tsunami countermeasures, such as ground improvement work and installation of tsunami protection fences, are planned to be completed by the end of FY2023.

For facilities other than HAW and TVF, including Main Plant (MP) and High Active Solid Waste Storage (HASWS), where a smaller amount of radioactivity is stored or retained compared to HAW and TVF, the JAEA continued the conventional safety management based on the permission for Tokai Reprocessing Plant, etc., and conducted simplified assessments for the integrity of external events such as design ground motion and design tsunami for the decommissioning plan based on discussions at the Oversight Team.

With the above assessment, the JAEA confirmed that major damage such as building collapses could be prevented, but made a plan to complete measures to prevent outflow, such as the installation of wire nets as necessary, by the end of FY2023 after grasping the current state of the entire reprocessing facility through a plant walkdown to check openings of buildings and storage conditions of radioactive waste, etc.

(2) Status of Vitrification

In the initial approval of the decommissioning plan in June 2018, the JAEA planned to manufacture 571 units of vitrified waste by FY2028 after approval of the decommissioning plan.

However, the vitrification was suspended due to an electric leakage incident in July 2019. After operation was resumed in August 2021, the offset resistance value between the main electrodes decreased due to the deposition of platinum group metals, causing the suspension of vitrification earlier than expected. This resulted in the production of only 20 units, while in the initial plan, 110 units of vitrified waste was to be manufactured after approval of the decommissioning plan till the present. Despite this situation, the JAEA has stated that it will not change its initial plan to complete the vitrification process by FY2028.

The JAEA has been working to remove residual glass in the melting furnace since December 2021 and plans to resume vitrification around June 2022.

Recognizing the above situation, the Oversight Team advised the JAEA to clarify the criteria for switching from the current melting furnace (No. 2), which is continuously interrupted, to another melting furnace (No. 3), which is under construction by the JAEA for the future updated plan, from the viewpoint of stable promotion of vitrification. The Oversight Team will continue to make confirmation on the work.

8. Implementation of Nuclear Regulatory Inspections of Commercial Power Reactors and Nuclear Fuel Cycle Facilities, etc.

To ensure safety of commercial power reactors and nuclear fuel cycle facilities, etc., the NRA conducts nuclear regulatory inspections consisting of routine inspections (carried out mainly by inspectors of the NRA Regional Offices) and team inspections (carried out mainly by inspectors with expertise dispatched from the headquarters of the Secretariat of the NRA) based on the Reactor Regulation Act. In FY2021, the team

inspection plan was changed due to effects of COVID-19 transmission, but it was generally implemented smoothly. In FY2021, the NRA made 54 statutory confirmations regarding pre-service operator inspections, wastes, vehicle transport, completion of decommissioning and radiodensity by making use of the results of nuclear regulatory inspections each time an application for statutory confirmation was submitted.

In addition, the NRA conducted 23 pre-service inspections, etc. as before based on interim measures from the time of revision of the Reactor Regulation Act.

(1) Inspection Results

(a) Comprehensive Assessment for FY2020 and Inspection Plan for FY2021

Regarding nuclear regulatory inspections conducted in the 4th quarter of FY2020, it was reported at the 8th FY2021 NRA Commission Meeting (May 19, 2021) that 12 inspection findings were confirmed at commercial nuclear power reactor facilities, but all had significance[14] of “green” (no additional actions for nuclear fuel facilities, etc.) and a severity level[15] of “SLIV.” Accordingly, a total of 27 inspection findings were confirmed in nuclear regulatory inspections in FY2020, which is the first year under the new inspection system starting from April 2020, and all were found to be “green” in significance level (no additional actions for nuclear fuel facilities, etc.) except for one “white” and one “red” confirmed at TEPCO's Kashiwazaki-Kariwa NPS.

In line with this, the comprehensive assessments for FY2020 and the inspection plan for FY2021 were agreed at the 8th FY2021 NRA Commission Meeting (May 19, 2021). For nuclear facilities other than the Kashiwazaki-Kariwa NPS, the performance indicator[16] was “green (or no additional actions)” and there were either no inspection findings, or the significance and severity of all inspection findings were determined to be “green (no additional actions) and SLIV.” Consequently, the action matrix[17]was set to 1 throughout the year, which is evaluated as the status where autonomous improvement is expected. In FY2021, regular baseline inspections for action matrix column 1 were planned to be continued. Regarding the Kashiwazaki-Kariwa NPS at which inspection findings with significance levels “white” and “red” were confirmed, the action matrix column was 2 in the 3rd quarter and 4 in the 4th quarter of FY2020, which is deemed to be in a state of long-term or severe deterioration in terms of safety and security activities. In FY2021, the action matrix column continued to be 4, and an increase in the number of baseline inspections and supplemental inspections were planned.

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[14] The degree of deterioration in safety and security activities of operators is evaluated in four levels (red, yellow, white, and green). “Red” indicates the greatest degree of deterioration, and the level that has large impact on functions or performance ensuring operational safety or security. In the case of nuclear fuel facilities, etc., it is evaluated in two stages (with additional action, no additional action).

[15] The severity level of the violation is evaluated in 4 levels (from SLI to SLIV). "SLI" is the most serious level, and caused or could have caused a serious situation in terms of nuclear safety or security.

[16] It is an indicator showing the performance of safety and security activities of operators, and evaluated in four levels (red, yellow, white, and green). “Red” indicates the greatest degree of deterioration, and the level that has large impact on functions or performance ensuring safety or security.

[17] For the deterioration recognized in safety and security activities of operators, regulatory measures will be decided in five columns (columns 1 to 5) according to the state of the facility. Column 5 is a state in which plant operation is not permitted.

(b) Inspection Results in FY2021

Regarding the results of nuclear regulatory inspections from the 1st to the 3rd quarters of FY2021, it was reported that a total of 26 inspection findings were confirmed at the 23rd FY2021 NRA Commission Meeting (July 28, 2021), an Extraordinary Meeting of the 24th FY2021 NRA Commission Meeting (July 28, 2021), the 45th FY2021 NRA Commission Meeting (November 17, 2021), an Extraordinary Meeting of the 46th FY2021 NRA Commission Meeting (November 17, 2021), the 65th FY2021 NRA Commission Meeting (February 16, 2022) and an Extraordinary Meeting of the 66th FY2021 NRA Commission Meeting (February 16, 2022). All had a significance of "green" (no additional actions for nuclear fuel facilities, etc.) and a severity level of "SLIV."

It was reported at the 44th FY2021 NRA Commission Meeting (November 10, 2021) that one of these inspection findings was confirmed several times as intentional misconduct and evaluated as severity level "SLIV (notified)" which would be notified to the operator.

In addition to inspection findings, it was reported at the 30th FY2021 NRA Commission Meeting (September 8, 2021) that two incidents corresponding to intentional misconduct were evaluated to severity level "SLIV (notified)," and this would be notified to the operator although no impact on nuclear safety was found.

(2) Actions Taken for Individual Issues

(a) Cracking of Weld of Pressurizer Spray Line Pipe of Ohi PS Unit 3

When ultrasonic testing (UT) was carried out on a weld of the pressurizer spray line pipe as part of the operator periodic inspection at the Ohi PS Unit 3 of Kansai Electric Power Co., Inc. from August 31 to September 1, 2020, significant test results were obtained indicating the presence of a defect in the form of a crack running along the weld on the inner surface of the pipe, and it was conjectured that this crack is attributable to stress corrosion cracking (SCC).

The NRA received a report on inspection results of a crack along the weld of the pressurizer spray line pipe and actions taken based on the results at the 59th FY2020 NRA Commission Meeting (February 24, 2021), and agreed on the temporary response approach of the Secretariat of the NRA. Additional explanations of the issues ((i) possibility of contribution of initial defects, (ii) accuracy and implementation frequency of UT, and (iii) feasibility of leak before break (LBB)), requested at that meeting, were reported at the 5th FY2021 NRA Commission Meeting (April 21, 2021). It was decided in future that the Secretariat of the NRA would hear explanations from the operator at public review meetings, etc. about plans, progress and results of investigation and studies on the mechanism of the generation and propagation of SCC in the primary coolant environment of a pressurized water reactor (PWR).

(b) Investigation and Analysis of the Cause of Rewriting Boring Log Data for Tsuruga NPS Unit 2

At the 833rd Review Meeting relating to Conformity to the New Regulatory Requirements for Nuclear Power Plants on February 7, 2020, an event was confirmed wherein information on a boring log for checking the validity of evaluation on the continuity of the fault in the premises of the Tsuruga NPS Unit 2 of the Japan Atomic Power Company to the ground directly below important facilities was deleted or changed without any explanation. Accordingly, it was decided at the 31st FY2020 NRA Commission Meeting (October 7, 2020) that the validity of the cause investigation and analysis conducted by Japan Atomic Power Company is confirmed in nuclear regulatory inspections.

After that, confirmation in nuclear regulatory inspections was continued in FY2021, and a report on the implementation status of inspections so far was submitted by the Secretariat of the NRA at the 23rd FY2021 NRA Commission Meeting (July 28, 2021). Reviews based on this report was discussed at the 25th FY2021 NRA Commission Meeting (August 18, 2021), and it was further decided that review meetings be suspended until the work process that satisfies the following two conditions is established in nuclear regulatory inspections:

(i) Ensure traceability of survey data.[18]

(ii) Clarify grounds for judgment if evaluation results shown in review materials are based on multiple survey methods.[19]

Then the Secretariat of the NRA inspected the above-mentioned work process and reported that it did not satisfy, in particular, condition (ii) at the 43rd FY2021 NRA Commission Meeting (November 2, 2021). When Japan Atomic Power Company makes necessary improvements, such as revising internal regulations, the Secretariat of the NRA will conduct inspections again and report the results to the NRA.

(c) Unauthorized Use of an ID Card and Partial Loss of Function of Physical Protection Equipment at TEPCO's Kashiwazaki-Kariwa NPS

Regarding the unauthorized use of an ID card at TEPCO's Kashiwazaki-Kariwa NPS which occurred on September 20, 2020, the NRA recognized, through nuclear regulatory inspections, deterioration of physical protection activities by the operator, and agreed on a provisional evaluation with a level requiring improvement with regulatory involvement (significance level "white") and severity level "SLIII" at an Extraordinary Meeting of the 54th FY2020 NRA Commission (February 8, 2021). Subsequently, the evaluation was finalized because there was no objection from TEPCO, and at an Extraordinary Meeting of the 55th FY2020 NRA Commission Meeting (February 9, 2021), a request was made to TEPCO to report corrective action plans and implementation results together with analysis of the fundamental cause. The report was

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[18] Primary data, such as survey data, which is the basis for evaluation results, must be reflected in review materials without modification, and the description of review materials traceable to the primary sources such as survey data.

[19] When there are multiple survey results (primary data) such as macroscopic observation results and thin section observation results, and different evaluation results are derived from these, the primary data and evaluation results of each must be shown in review materials, and the final evaluation results and their technical basis indicated.

received on March 10, 2021.

Regarding the partial loss of function of physical protection equipment at TEPCO's Kashiwazaki-Kariwa NPS, which came to light due to a report from TEPCO to the Secretariat of the NRA on January 27, 2021, the NRA agreed, at an Extraordinary Meeting of the 64th FY2020 NRA Commission Meeting (March 16, 2021), on a provisional evaluation with a level of major impact on nuclear material physical protection function or performance (significance "red") and severity level "SLI," and notified the result of provisional evaluation to TEPCO. Later on March 18, 2021, a response was received from TEPCO that it did not wish to make statement, and the evaluation result for this incident was finalized. Accordingly, the action matrix column was changed from 2 to 4, and at an Extraordinary Meeting of the 66th FY2020 NRA Commission Meeting (March 23, 2021), it was decided to make a request to TEPCO for a report within 6 months on corrective action plans relating to the unauthorized use of an ID card and partial loss of function of physical protection equipment at TEPCO's Kashiwazaki-Kariwa NPS, and this was notified to TEPCO. At the 67th FY2020 NRA Commission Meeting (March 24, 2021), it was decided, based on the Reactor Regulation Act, to issue an instruction for corrective measures to TEPCO, and a policy was adopted of prohibiting movement of specified nuclear fuel material[20] at the Kashiwazaki-Kariwa NPS until the effectiveness of improvements has been ascertained. Instructions to take corrective measures were subsequently issued on April 14, 2021.

[20] Of the radioactive materials contained in the nuclear fuel (new and spent fuel) used in nuclear power plants, nuclear fuel materials, such as Plutonium (excluding Pu238) and Uranium 233, specified by the Reactor Regulation Act

(Reference 1) Overview of case of unauthorized use of ID card at TEPCO's Kashiwazaki-Kariwa NPS

The case involved employee A at the TEPCO's Kashiwazaki-Kariwa NPS (working in the central control room) (hereinafter referred to as "Employee A"). On the morning of September 20 (Sunday), 2020, which was a work day for Employee A, Employee A could not find his ID card, which had been stored in his personal locker in the employees-only changing room, but he did not report this loss to the Physical Protection Group, and lost the opportunity to take action to invalidate the ID card. Also, Employee A knew that NPS employee B (working in the central control room) (hereinafter referred to as "Employee B") was not working on that day, and because Employee B had left his personal locker unlocked, and there was imperfect ID card management, Employee B's ID card was removed from his locker without permission.

In response to a name check by a contract security guard at the entrance/exit of the peripheral protected area, Employee A declared the name of Employee B. In response to Employee A's declaration, the security guard compared Employee A's face with the ID card a number of times, and despite some doubts, allowed Employee A to enter the peripheral protected area.

At the entrance/exit of the protected area, multiple authentication errors occurred, and an employee security guard (hereinafter referred to as "Protection Employee C") received an error warning. Through the monitor, Protection Employee C took steps like comparing with the stored face photograph, and while having some doubts about the difference, opened the entrance/exit door of the peripheral protected area without any further checking of the person's identify. (At this time, C recognized the pertinent person as Employee B.) Although Protection Employee C was not in a managerial position relating to access control operations, he did not seek instructions from the person in the managerial position in the Physical Protection Group, and at his own discretion decided to accept the need for storing identification information of Employee A using the name of Employee B. More specifically, Protection Employee C instructed the contract security guard to store the identification information of Employee A, using the name of Employee B, for the ID card of Employee B, and that was done as instructed. At the time, the Kashiwazaki-Kariwa NPS had no rules relating to information storage due to occurrence of an identification information error.

In accordance with Protection Employee C's instructions, the contract security guard stored the identification information of Employee A, and Employee A passed through the entrance/exit door of the peripheral protected area using the ID card of Employee B. In that process, another contract security guard who remembered the face of Employee A sensed something wrong and spoke up, but Employee A used the name of Employee B.

As a result of this series of dishonest actions, Employee A entered the central control room, which is a protected area.

On the evening of that day, after Employee A finished work, he found his own ID card. The card had fallen at the back of his personal locker in the employees-only changing room. He returned Employee B's ID card to Employee B's locker. When Employee B tried to enter the protected area for work on the morning of September 21, his ID card produced an error. Protection Employee C, who handled the problem with Employee B's ID card the previous day, thought it suspicious for the problem to recur 1 day latter, and when Employee B was questioned about the situation, the series of actions by Employee A came to light. On that same day (September 21), the Physical Protection Group of the Kashiwazaki-Kariwa NPS reported the incident to the Division of Nuclear Security, NRA Secretariat.

(Reference 2) Overview of case of partial loss of function of physical protection equipment at TEPCO's Kashiwazaki-Kariwa NPS

At TEPCO's Kashiwazaki-Kariwa NPS, there was a partial loss of function of physical protection equipment, and effective alternative measures had not been taken. Therefore, in and after March 2020, the facility was in a condition where unauthorized intrusion could not be detected at a number of locations.

At the Kashiwazaki-Kariwa NPS, recovery took a long time, even though the organization recognized the need for recovery of physical protection equipment. Also, no improvements had been made, even though employee security guards at TEPCO recognized that the alternative measures were not effective. As a result, there were multiple locations where unauthorized entry may be undetectable for more than 30 consecutive days.

Recovery of physical protection equipment at these locations is finished. No unauthorized intrusions have been confirmed at the pertinent locations. Due to instructions from the NRA Secretariat, the system is now such that effective alternative measures are taken if a new loss of function occurs with physical protection equipment.

Also, in the period from January 2018 to March 2020, partial loss of function of physical protection equipment occurred at multiple locations at the Kashiwazaki-Kariwa NPS, and recovery took a long time.

As indicated above, the Kashiwazaki-Kariwa NPS was in a situation where organizational management functions had declined. Over a long period, the effectiveness of protective measures had not been properly ascertained, and there was potential for a severe incident in terms of physical protection.

(3) Status of Supplemental Inspections to TEPCO's Kashiwazaki-Kariwa NPS

The implementation policy of supplemental inspections imposed on TEPCO's Kashiwazaki-Kariwa NPS was decided to be conducted in phases depending on the progress of work by TEPCO at the 3rd FY2021 NRA Commission Meeting (April 14, 2021). Specifically, the supplemental inspection was divided into four phases: Phase I to conduct detailed investigation of facts related to both incidents before TEPCO submits the report, Phase II to confirm the operation status of corrective action plans after TEPCO submits the report, and, as necessary, Phase III to confirm responses to inspection findings in Phase II. For smooth and effective work related to supplemental inspections, a "TEPCO's Kashiwazaki-Kariwa NPS Supplemental Inspection Team" was launched on April 22, 2021, and thus began the supplemental inspection.

The specific details of Phase I were agreed at an Extraordinary Meeting of the 9th FY2021 NRA Commission Meeting (May 20, 2021), and the inspection status was reported four times at an Extraordinary Meeting of the 14th FY2021 NRA Commission Meeting (June 16, 2021), an Extraordinary Meeting of the 18th FY2021 NRA Commission Meeting (June 30, 2021), an Extraordinary Meeting of the 22nd FY2021 NRA Commission Meeting (July 21, 2021), and an Extraordinary Meeting of the 33rd FY2021 NRA Commission Meeting (September 15, 2021).

TEPCO submitted “The Report on Corrective Actions for Unauthorized Use of an ID Card and Partial Loss of Function of Physical Protection Equipment” on September 22, 2021, and an overview report was presented at the 35th FY2021 NRA Commission Meeting (September 29, 2021), where approaches to provide measures to formulate a plan for coming Phase II inspections was decided. The Phase II inspection plan was decided at an Extraordinary Meeting of the 38th FY2021 NRA Commission Meeting (October 13, 2021) and the 39th FY2021 NRA Commission Meeting (October 20, 2021). Thereafter, the Phase II supplemental inspection was commenced.

The status of Phase II inspection was reported seven times at extraordinary meetings of NRA Commission Meetings, during which matters of concern to be shared with TEPCO and advice to TEPCO’s efforts were discussed, and ways to promote inspections and evaluate corrective actions were confirmed and examined while inspections were promoted in sequence (the extraordinary meetings were: of the 46th FY2021 NRA Commission Meeting (November 17, 2021), the 55th FY2021 NRA Commission Meeting (December 22, 2021), the 61st FY2021 NRA Commission Meeting (January 19, 2022), the 66th FY2021 NRA Commission Meeting (February 16, 2022), the 76th FY2021 NRA Commission Meeting (March 30, 2022), the 4th FY2022 NRA Commission Meeting (April 13, 2022) and the 6th FY2022 NRA Commission Meeting (April 20, 2022)).

Furthermore, at the 7th FY2022 NRA Commission Meeting (April 27, 2022), the NRA received a report on the interim summary of inspection results thus far, and in confirming the implementation status of corrective action plans, agreed on ways to promote supplemental inspections, including requests for action by TEPCO and also perspectives on their evaluation. Supplemental inspections focusing on the implementation status of corrective action plans and their effects will be promoted based on that policy in future.

9. Confirmation of Causes and Preventive Measures for Problems in Nuclear Facilities

Article 62-3 of the Reactor Regulation Act requires nuclear operators to report to the NRA accidents and failures in nuclear facilities stipulated in the NRA Rule (hereinafter referred to as “incidents under obligation to report” in this paragraph and Section 1-8 of Chapter 4 hereof).

In FY2021, there were three incidents under obligation to report - two in commercial nuclear power reactors, and one in nuclear fuel cycle facilities, etc. The NRA received reports on these incidents from the operators and has been strictly checking on the operator’s cause investigation and recurrence prevention measures (see Section 1 (8) of Chapter 4 for the incidents under obligation to report related to specified nuclear facilities).

Incidents under obligation to report are subject to evaluations according to the International Nuclear and Radiological Event Scale ("INES"[21]). Of the three incidents that occurred in FY2021, the incident at the Ohi PS of Kansai Electric Power Co., Inc. on August 5, 2021 was evaluated as level 0 (no safety significance). The incidents at Toshiba Materials Co., Ltd. and the Takahama PS of Kansai Electric Power Co., Inc. are under evaluation. The incident that occurred in FY2020 at the International Research Center for Nuclear Materials Science at the Institute for Materials Research of Tohoku University was evaluated as level 0 (no safety significance).

(1) Response to Accidents and Failures in FY2021

(a) Decrease in Generator Output due to Seawater Leak from Circulating Water Pipe at Ohi PS Unit 3

On August 5, 2021, Kansai Electric Power Co., Ltd. reported to the NRA that a drop in generator output due to seawater leak from the circulating water pipe at Unit 3 of the Ohi PS was confirmed, and that this corresponds to an incident under obligation to report.

A report from Kansai Electric Power Co., Inc. dated August 10, 2021 indicated the cause of the incident and corrective actions taken followed by a correction of the report on August 13, 2021. In the report, Kansai Electric Power Co., Inc. claimed that the seawater leak from the circulating water pipe was caused by corrosion from rainwater that had dripped down continuously for years around the vent valve of the circulating water pipe where the leak occurred. There was insufficient confirmation of the state of corrosion of the connecting pipes, due to their location in narrow spaces that made them difficult to see during visual inspections. In time, the anticorrosion coating on the surface of the pipe had gradually peeled off, and corrosion progressed, leading to a perforation.

At the 25th FY2021 NRA Commission Meeting (August 18, 2021), a draft response approach (e.g., routine inspections and interview surveys as necessary) was approved based on "The Studies and Future Approaches of Reports based on the Reactor Regulation Act (2nd)." At the 65th FY2021 NRA Commission Meeting (February 16, 2022), the Secretariat of the NRA reported the inspection findings with significance level "green" and severity level "SLIV" resulting from nuclear regulatory inspections, etc. in the 3rd quarter of FY2021.

(b) Leak of Nuclear Materials, etc. outside the Controlled Area at Toshiba Materials Co., Ltd.

On October 12, 2021, Toshiba Materials Co., Ltd. reported to the NRA that the possibility of leak of nuclear materials from the controlled area cannot be denied, and that this corresponds to an incident under obligation to report. A report from Toshiba Materials Co., Ltd. dated March 23, 2022 indicated the cause of the incident and corrective actions taken. The NRA is strictly checking the validity of cause investigation and recurrence prevention measures through interviews, etc.

In the occurrence of this incident, Toshiba Materials Co., Ltd. submitted, on December 22, 2021, an application for permission to change nuclear fuel material usage related to the addition of equipment, which had been omitted from the previous application. After review, permission was granted on April 4, 2022.

[21] The International Nuclear and Radiological Event Scale

(c) Wear on Steam Generator Tubes of Unit 3 of Takahama NPS

On March 30, 2022, Kansai Electric Power Co., Ltd. reported to the NRA that when an eddy current testing (ECT) was conducted to confirm the integrity of heat transfer tubes in three steam generators (SGs) at the Takahama PS Unit 3 which has had periodic outages, significant signal indications were observed in three tubes of two GSs, and this corresponds to an incident under obligation to report. The signal from one tube indicated an inner surface flaw along the tube axis direction on the high temperature side tube sheet, and the signal from other two indicated thinning from the outer surface near the tube support plate.

The operator is currently investigating the cause.

(2) Response to Accidents and Failures in FY2020

(a) Collapse of Exhaust Stack at the Research Building, International Research Center for Nuclear Materials Science, Institute for Materials Research, Tohoku University

On April 13, 2020, Tohoku University reported to the NRA that a collapse of an exhaust stack was confirmed at the Research Building of the International Research Center for Nuclear Materials Science, Institute for Materials Research, and this corresponds to an incident under obligation to report.

A report from Tohoku University dated July 15, 2020 indicated the cause of the incident and corrective actions taken. The NRA received a report from the Secretariat of the NRA to the effect that the cause investigation and recurrence prevention measures were evaluated as appropriate at the 5th FY2021 NRA Commission Meeting (April 21, 2021).

Section 2 Promotion of Safety Research and Continuous Improvement of Regulatory Requirements

1. Proactive Implementation of Safety Research

(1) Implementation of Safety Research and Publication of Results

The NRA conducts safety research projects based on the “Basic Policy on Safety Research in the NRA” (NRA decision on July 6, 2016) and the “Safety Research Field to be Promoted and its Enforcement Policy (for safety research to be conducted in and after FY2021)” (agreed by the NRA on June 24, 2020). It is also working to publish safety research results through “NRA Technical Report Series” that serves as a basis for judgment in regulatory requirements, a variety of guides, reviews and inspections in consideration from perspective of utilization in regulations based on experimental data obtained in safety research, and “NRA Technical Note Series” that compiles data and information obtained through investigation, as well as academic journals and presentations at academic conferences.

In FY2021, 23 safety research projects, including 8 new ones, were implemented in 14 fields (see Table 2-4).

Table 2-4 Safety Research Projects Conducted in FY2021

No.	Area	Project
1	External events	Research on more advanced techniques for seismic hazard assessment near seismic sources (2020-2023)
2		Research on tsunami evaluation methods and source estimation of past tsunamis (2021-2024, New)
3		Study on evaluating the activity of faults (2020-2023)
4		Research for accumulating knowledge of large-scale eruption process (2019-2023)
5		Research on sophistication of fragility evaluation methods for facilities and equipment related to external events (2021-2024, New)
6	Fire protection	Research on fire hazard analysis for protection of nuclear power stations (Phase 2) (2021-2024, New)
7	Human and organizational factors	Regulatory research for systematic analysis of human and organizational factors based on human factors engineering (2019-2023)
8	Risk evaluation	Development of PRA methods and their application to regulation (2017-2021)
9	Severe accident	Experiments for reduction on uncertainty of important physicochemical phenomena under severe accident conditions (2020-2025)
10		Development of simulation codes for physicochemical phenomena including large uncertainties under severe accident conditions (2017-2022)
11		Development of analysis methodologies for the containment failure and probabilistic risk assessment associated with severe accident conditions (2017-2022)
12	Nuclear and thermal-hydraulic characteristics	Study on best-estimate thermal-hydraulic evaluation for nuclear power plants (2019-2022)
13		Study on optimal evaluation method and uncertainty evaluation method in nuclear characteristics analysis (2021-2024, New)
14	Nuclear fuel	Evaluation study on fuel failure impact on reactor core coolability under accident conditions (2019-2023)
15	Materials and structures	Research on ultimate endurance evaluation of containment in severe accident conditions (2017-2021)
16		Research on aging degradation assessment and verification using the equipment and materials used in nuclear power plants (2020-2024)
17	Specified nuclear facilities	Development of a database and evaluation methodology for criticality of fuel debris at Fukushima Daiichi Nuclear Power Plants (2014-2024)
18	Fuel cycle facilities	Research on the progress of events such as serious accidents at reprocessing and MOX fuel fabrication facilities (2021-2025, New)
19		Research on assessment methods relating to the latest analysis techniques in the areas of transportation and storage of spent fuel (2020-2023)
20	Radioactive waste disposal facilities	Research on long-term performance assessment for radioactive waste disposal (2021-2024, New)
21	Decommissioning and clearance	Research on quantitative evaluation technique for radioactive concentration, etc. of radioactive waste (2021-2024, New)
22	Nuclear emergency preparedness and response	Research on the review of emergency action level (EAL) considering special facilities for severe accident management, etc. (2021-2025, New)
23	Nuclear emergency response, radiation control and regulation	Strategic Program for Promoting Regulatory Radiation Safety Research (2017-2021)

As the publication of results, an NRA technical report was published in FY2021. This technical report provides the details of the dose assessment for uranium and its progeny based on the various evaluation scenarios and conditions, which were referred to in the discussion of the "Basic Policy on Regulations for the Clearance and Disposal of Uranium Waste" decided by the NRA on March 10, 2021. Four NRA technical notes were also published (see Table 2-5).

Table 2-5 Publication of Safety Research Results (NRA Technical Report Series and NRA Technical Note Series)

No.	Category	Report title
1	NRA Technical Report	Dose Assessments based on Scenarios for Clearance and Disposal of Uranium Waste
2	NRA Technical Note	Specific Design Examples for Considerations of Decommissioning and Minimization of Radioactive Waste Generation
3		Literature Survey on Postfire Safe-shutdown Circuit Analysis in U.S.
4		Data on Aircraft Fall Accidents (2000-2019)
5		A Study on Regulatory Activities in the U.S.A. for Downstream Effects of PWR and BWR ECCS Strainer Clogging Issues

In addition, the NRA staff members published 22 articles in journals, presented eight proceedings (peer-reviewed) at international conferences, and made 32 presentations at academic conferences. As efforts to promote the publication of safety research results, there were six presentations by the NRA staff members in collaboration with the JAEA's Nuclear Safety Research Center at the Nuclear Safety Research Center Progress Meeting. Moreover, the NRA staff members were awarded with two academic prizes for their excellent academic achievements in safety research (JSM Award for Excellent Paper, and Outstanding Presentation Award at the Fall Meeting of the Thermal Hydraulics Division, Atomic Energy Society of Japan).

(2) Participation in Joint Research Activities

The NRA has been participating in international joint research projects in collaboration with the Nuclear Safety Research Center of the JAEA. As bilateral international activities in FY2021, the NRA exchanged information with the U.S. NRC and the French Institute for Radiological Protection and Nuclear Safety (IRSN) and participated in 19 international joint research projects of the OECD/NEA, and 11 working groups and senior expert meetings that fall under the umbrella of the OECD/NEA/CSNI[22], to collect technical findings including the latest trends in each research field.

Regarding the research and investigation of the accident at TEPCO's Fukushima Daiichi NPS, the NRA participated in the research project (ARC-F[23]) of OECD/NEA/CSNI and shared with 12 countries the recognition on the current status and issues of analysis related to accident scenarios and fission product transfer and diffusion. In addition, since ARC-F was completed in December 2021, the framework and specific activities for the subsequent research activity (FACE) were discussed and agreed.

Regarding joint research projects, which contribute to improving the technical competency of the NRA research staff members, the NRA conducted 20 joint research projects, which exceeded the number of those in FY2020, with universities and research agencies such as JAEA according to the Joint Research Enforcement Provisions established in April 2017.

(3) Safety Research Assessment and Policy Development

The NRA agreed on the post-evaluation of seven safety research projects completed in FY2020 at the 13th FY2021 NRA Commission Meeting (June 16, 2021), and the 19th FY2021 NRA Commission Meeting (July 7, 2021). It also agreed on pre-evaluations of two safety research projects to be started in FY2022 at the 60th FY2021 NRA Commission Meeting (February 1, 2022).

Based on the "Basic Policy on Safety Research in the NRA," the NRA agreed on the "Safety Research Field to be Promoted and its Enforcement Policy (for safety research to be conducted in and after FY2022)" at the 20th FY2021 NRA Commission Meeting (July 14, 2021). Moreover, regarding the next medium- to long-term goals (FY2022 to FY2028) of the JAEA, which is a technical support organization, the NRA agreed on a

[22] Organisation for Economic Co-operation and Development / Nuclear Energy Agency / Committee on the Safety of Nuclear installations

[23] Analysis of Information from Reactor Buildings and Containment Vessels of Fukushima Daiichi Nuclear Power Station

draft for the NRA's part of co-management based on the opinion of the JAEA Sub-Committee of the National Research and Development Agency Council at the 63rd FY2021 NRA Commission Meeting (February 2, 2022), then issued a direction on February 28, 2022. After the submission of the next medium- to long-term plan by the JAEA in response to the next medium- to long-term goals, the NRA agreed on the draft for the NRA's part of co-management at the 70th FY2021 NRA Commission Meeting (March 9, 2022), and granted approval on March 24, 2022.

(4) Review of Safety Research Structure

Regarding the implementation structure for radiation protection research in and after FY2022, approval was granted at the 67th FY2020 NRA Commission Meeting (March 24, 2021) for conducting research in the Regulatory Standard and Research Department, advancing the preparation for that through collaboration between the Regulatory Standard and Research Department and the Radiation Protection Department in FY2021, and deciding the details of safety research topics for implementation in and after FY2022 through the process on the safety research enforcement policy made under the Regulatory Standard and Research Department. At the 7th FY2021 NRA Commission Meeting (May 12, 2021), the NRA received a report stating that the selection of research division responsible for radiation protection research must be considered with the association of technical fields, and taking this opportunity, the possible improvements of the implementation structure in the Regulatory Standard and Research Department must also be discussed.

Consequently, at the 20th FY2021 NRA Commission Meeting (July 14, 2021), the NRA agreed on the safety research structure in and after FY2022 including the enhancement of the risk assessment research structure and collaboration between research divisions, in addition to the consideration of research divisions responsible for radiation protection research.

2. Accumulation of the Latest Scientific and Technological Knowledge and Findings

(1) Collection of the Latest Scientific and Technological Knowledge and Findings

As an activity for continuously improving regulatory requirements on the basis of the latest domestic and overseas scientific and technological knowledge, the NRA's Generic Issues Task Force has been organizing information on overseas regulatory trends, safety research, international standards and academic societies to extract information that require review in terms of our country's regulations and nuclear facility safety, on the basis of a process for introducing the latest findings into regulations - process approved at the 45th FY2016 NRA Commission Meeting (November, 22, 2016). In FY2021, the NRA extracted five cases of technical information requiring some sort of regulatory intervention. These five types of technical information were shared at the meeting of the Technical Information Committee.

(2) Utilization of Scientific and Technological Knowledge and Findings Obtained from Safety Research in Regulatory Operations

In order to utilize the latest scientific and technological knowledge and findings obtained through safety research, both domestic and overseas, in regulatory work such as review and inspection, the NRA Secretariat's Research Divisions provide the Nuclear Regulation Department with technical support such as providing information. In

FY2021, the Research Divisions provided the Nuclear Regulation Department with 51 cases of technical support in the licensing review of conformity to new regulatory requirements, participation in team meetings, and so forth.

3. Continuous Improvement of Regulatory Requirements

(1) Reflection of the Latest Knowledge into Regulatory Requirements

(a) Development of Regulatory Requirements for Seismic Isolation of Buildings and Structures

At the 40th FY2020 NRA Commission Meeting (November 25, 2020), results of the study were reported from the Study Team on Seismic Isolation of Buildings and Structures, and the NRA agreed to the formulation of the Review Guide for Seismic Isolation of Buildings and Structures and the direction of revisions on related regulatory requirements, etc.

At the 41st FY2021 NRA Commission Meeting (October 27, 2021), the NRA reviewed a draft revision to the Regulatory Guide of NRA Rule on Standards for the Location, Structure, and Equipment of Commercial Power Reactors, a draft revision to the Review Guide for Design Basis Ground Motion and Seismic Design Policy, and a draft for the Review Guide for Seismic Isolation of Buildings and Structures. After soliciting public comments, the NRA revised and established these subjects at the 68th FY2021 NRA Commission Meeting (February 24, 2022).

(b) Responses to Electromagnetic Compatibility at Nuclear Power Plants

Interference due to electromagnetic waves between devices used in instrumentation and control facilities is considered a possible factor in common cause failures of digital safety protection systems in nuclear power reactor facilities. It was therefore decided at the 39th Technical Information Committee Meeting (November 20, 2019) to start surveys on specific standards, etc. to be implemented in the design with electromagnetic compatibility ("EMC") in mind.

At the 49th Technical Information Committee Meeting (September 9, 2021), survey results were reported regarding detailed documents related to overseas test methods, items related to device certification, equipment to be included and application examples at nuclear power plants, etc. Thereafter, at the 17th Meeting to Hearing Opinions of Licensees Concerning New Regulatory Requirements (December 16, 2021), ATENA presented specific adaptation to electromagnetic environments at domestic nuclear power plants related to EMC measures. The results were reported at the 51st Technical Information Committee Meeting (January 20, 2022) and the 65th FY2021 NRA Commission Meeting (February 16, 2022).

(c) Implementation of Review and Inspection Guide for Ergonomics Design and Development

Based on the necessity of considering human and organizational factors, pointed out by the IRRS mission in FY2015, the NRA decided to develop a guide for assessing a reactor control room, a guide for safety culture, and a guide for cause analysis. At the 49th FY2020 NRA Commission Meeting (January 13, 2021), the NRA reviewed a draft for the Review and Inspection Guide for Ergonomics Design and Development, and after soliciting public comments, established the guide at the 1st FY2021 NRA Commission Meeting (April 7, 2021).

(d) Consideration of Introduction of Knowledge Obtained from the "Interim Summary of Investigation and Analysis of TEPCO's Fukushima Daiichi NPS Accident" into Regulations

It was agreed at the 1st FY2021 NRA Commission Meeting (April 7, 2021) to discuss the introduction of knowledge obtained from the "Interim Summary of Investigation and Analysis of TEPCO's Fukushima Daiichi NPS Accident" into the regulations at the Technical Information Committee Meeting. The results of screening related to regulatory intervention were discussed at the 45th Technical Information Committee Meeting (April 14, 2021) and the 46th Technical Information Committee Meeting (May 26, 2021).

Of the topics discussed, the introduction of knowledge on hydrogen protection into the regulations was reported at the 17th FY2021 NRA Commission Meeting (June 30, 2021). The NRA urged the Secretariat of the NRA to reach an early conclusion by setting a time limit at the 48th Technical Information Committee Meeting (July 20, 2021) and agreed on the way to proceed future review at the 25th FY2021 NRA Commission Meeting (August 18, 2021). Later, at the 50th FY2021 NRA Commission Meeting (December 8, 2021), the progress of review on the introduction of knowledge on hydrogen protection into the regulations (interim report) and future plans were reported. The Secretariat of the NRA submitted a report stating that the current requirements and designs based on these requirements are believed to prevent hydrogen explosion events to a considerable extent. However, considering the hydrogen retention phenomenon and the possibility of the generation of considerable combustible gases, indicated in the interim report, the possibility of difficulty in responding to severe accidents is undeniable. Taking this into account, namely, acknowledging the possibility of significant uncertainty in the knowledge of hydrogen protection, the policy of continuing the review including discussions with operators was presented, and the NRA agreed on it.

(e) Establishment of Regulatory Requirements for Category 2 Waste Disposal, etc.

The NRA has discussed about regulatory requirements for intermediate-depth disposal from FY2014, and produced an outline of requirements for the intermediate-depth disposal by FY2020.

The NRA has been engaged in examination of regulations for the clearance and disposal of uranium waste since FY2019 and established the "Basic Policy on Regulations for the Clearance and Disposal of Uranium Waste" at the 63rd FY2020 NRA Commission Meeting (March 10, 2021).

The NRA has also discussed the regulations on the clearance and burial of uranium waste since FY2019, and established the Concept of Regulations Concerning Clearance and Burial of Uranium Waste at the 63rd FY2020 NRA Commission Meeting (March 10, 2021).

Based on these results, the NRA decided to call for public comments regarding draft revisions to the NRA Rules regarding category 2 waste disposal and to the NRA Rules regarding the clearance, and a draft for the review guide for waste disposal site of intermediate-depth disposal at the 17th FY2021 NRA Commission Meeting (June 30, 2021). According to the results of public comments, revisions of these NRA Rules and the establishment of a review guide were decided at the 35th FY2021 NRA Commission Meeting (September 29, 2021) and in force on October 21, 2021.

Furthermore, regarding the review guide for waste disposal site of intermediate-depth disposal, an additional draft revision was provided to add items concerning the evaluation of borehole scenarios, and natural phenomena scenarios and human intrusion scenarios for pit disposal and trench disposal based on the review experience on the waste burial operation of the JNFL, and the solicitation of public comments was agreed at the 64th FY2021 NRA Commission Meeting (February 9, 2022). According to the solicited public comments, the revision of the review guide was agreed at the 5th FY2022 NRA Commission Meeting (April 20, 2020).

(f) Establishment of Criteria for Judging the "Situation not Requiring Action to Prevent from Radiation Hazards" for Confirming the Completion of Decommissioning of Nuclear Facilities

As one of annual priority plans for FY2021, the NRA set the establishment of judgment criteria for the release of site[24], which is also a recommendation of the IRRS mission (NRA Annual Strategic Plan for FY2021 (decided at the NRA Commission Meeting on March 24, 2021)).

At the 50th FY2020 NRA Commission Meeting (January 20, 2021), it was decided to examine specific judgment criteria for, among the criteria for confirming the completion of decommissioning, "the fact that soil relating to the site of the facility to be decommissioned and the buildings still remaining at the pertinent site are in a situation not requiring action to prevent harm due to radiation hazards" (hereinafter referred to as "judgment criteria").

Of the criteria for confirming the completion of decommissioning specified in the operation rules for individual nuclear facilities pursuant to the Reactor Regulation Act, compiled by the Secretariat of the NRA, the range of review and items to be reviewed in relation to judgment criteria were agreed later at the 28th FY2021 NRA Commission Meeting (September 1, 2021). A draft for the "guide for judging conditions of site soil, etc. in confirming the completion of decommissioning," which exemplifies the method of judgment for judgment criteria, was reviewed at the 64th FY2021 NRA Commission Meeting (February 9, 2022), and after soliciting public comments, was established at the 75th FY2021 NRA Commission Meeting (March 30, 2022).

(g) Considerations to Ensure Nuclear Safety in Site Selection for the Final Disposal of Specified Radioactive Waste

In the Basic Policy on Final Disposal of Specified Radioactive Waste decided by the Cabinet Office in May 2015, it is stipulated that in order to rationally proceed with the selection of outline survey areas, etc., it is appropriate for the NRA to show considerations according to the progress for ensuring safety in site selection phases under the major premise that there will be no prejudice to the specific review of license application in the future safety regulations, etc. Based on this policy, the NRA started discussions on the considerations to ensure nuclear safety in site selection phases at the 60th FY2021 NRA Commission Meeting (January 19, 2022). At that time, it was decided that views of experts on volcanic activities would be heard for the purpose of expanding scientific and technological knowledge and findings on the characteristics of volcanic

[24] Refers to the site and building subject to decommissioning

formation mechanisms in Japan and their regional characteristics. In FY2021, two meetings were held to hear views on the mechanism of volcanic formation and their regional characteristics in Japan.

(h) Formulation of Decommissioning Approval Criteria for Usage Facilities

Since there are no detailed review standards for decommissioning plans for nuclear fuel material usage facilities, etc., it was agreed to set a policy for formulating the "Review Standards for Decommissioning Plans for Nuclear Fuel Material Usage Facilities, etc. not Subject to Article 41 of the Order[25]" (hereinafter referred to as "Decommissioning Review Standards") for those which were expected to undergo decommissioning but not subject to Article 41 of the Order at the 25th FY2021 NRA Commission Meeting (August 18, 2021). Thereafter, it was agreed to solicit public comments on the draft Decommissioning Review Standards at the 37th FY2021 NRA Commission Meeting (October 13, 2021), and based on the resulting public comments, the Decommissioning Review Standards were established at the 52nd FY2021 NRA Commission Meeting (December 15, 2021).

(i) Concrete Descriptions of Regulatory Requirements and Improvement of Expressions

At the 70th FY2020 NRA Commission Meeting (March 31, 2021), solicitation of public comments was agreed regarding a draft revision to regulatory requirements based on the FY2020 Implementation Plan for concrete description and improvement of expressions of regulatory requirements in line with review results. At the 15th FY2021 NRA Commission Meeting (June 23, 2021), partial revisions were accordingly decided for the interpretation, etc. of the NRA Rule on Standards for the Location, Structure, and Equipment of Commercial Power Reactors, and the Review Guide, etc. for Radiation Exposure Assessment related to the Habitability of Control Rooms and Emergency Response Centers in the Event of a Serious Accident Related to Commercial Power Reactors.

At the 3rd FY2021 NRA Commission Meeting (April 14, 2021), the implementation plan for FY2021 was agreed and revision procedures were promoted, and at the 68th FY2021 NRA Commission Meeting (February 24, 2022), a draft revision to the Review Guide for Design Basis Ground Motion and Seismic Design Policy, etc. were reviewed as part of the work and solicitation of public comments was agreed.

A revision plan for the special facilities for severe accident management was reported at the 12th FY2021 NRA Commission Meeting (June 9, 2021), and partial revisions to the interpretation of the NRA Rule on Standards for the Location, Structure, and Equipment of Commercial Power Reactors were discussed at an Extraordinary Meeting of the 42nd FY2021 NRA Commission Meeting (October 27, FY2021) and the 43rd FY2021 NRA Commission Meeting (November 11, 2021). After solicitation of public comments, the interpretation was partially revised at the 75th FY2021 NRA Commission Meeting (March 30, 2022).

The purpose of review guides, which were instructed to be consolidated at the 61st FY2020 NRA Commission Meeting (March 3, 2021) was agreed on the 13th FY2021 NRA Commission Meeting (June 16, 2021).

[25] Facilities, etc. that do not use nuclear fuel materials, listed in each item of Article 41 of the Enforcement Order for the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors.

(2) Study on Continuous Improvement of Safety

At the 15th FY2020 NRA Commission Meeting (July 8, 2020), a decision was made to launch the Study Team on Continuous Improvement of Safety to make efforts for continuous improvement of safety of nuclear facilities smoother and more effective. The study team meeting was held nine times in FY2020 and four times in FY2021. The team compiled the "Review of Discussion" and made it public on July 30, 2021.

At the 25th FY2021 NRA Commission Meeting (August 18, 2021), the study team reported results of discussions on continuous safety improvements, and a response approach to the matters identified as issues to be addressed in the "Review of Discussion" was agreed. Specifically, discussions included the promotional measures for the preparation of a document consolidating the concept of backfitting, systematization of response and documentation of new findings (e.g., Japanese version Information Notice and complete list of documents accepted by the NRA), and expression of opinions (e.g., publication of documents describing the background and history of regulatory activities, etc.) in the name of individual staff of the Secretariat of the NRA.

At the 64th FY2021 NRA Commission Meeting (February 9, 2022), procedures for the preparation of a document related to backfitting was discussed and it was decided that the Secretariat of the NRA will analyze backfitting cases implemented so far.

As described in 2. (2) of Section 1 in Chapter 1, a new "Information Notice for Nuclear Operators" was to be issued as a method to raise awareness of regulatory authorities.

(3) Technical Evaluation of Private Standards

Based on three meetings held by the "Study Team on Technical Evaluation of Japan Electric Association Standards for Eddy Current Flaw Testing, Ultrasonic Testing, and Leakage Rate Testing," the NRA agreed on a draft revision to the technical evaluation of Japan Electric Association standards for Eddy Current Flaw Testing, Ultrasonic Testing, and Leakage Rate Testing, and the interpretation of related regulations, and solicitation of public comments at the 3rd FY2021 NRA Commission Meeting (April 14, 2021). After descriptive corrections in line with public comments, the revision was decided upon at the 21st FY2021 NRA Commission Meeting (July 21, 2021).

At the 15th FY2021 NRA Commission Meeting (June 23, 2021), the NRA agreed to hold the meeting by the "Study Team on Standard Technical Evaluation of the Atomic Energy Society of Japan on the Method to Determine Radioactivity Concentration of Waste Subjected to Mid-depth Disposal." In FY2021, the study team meeting was held three times (July 30, 2021, September 21, 2021, and November 5, 2021) to promote discussions on formulating the technical evaluation report.

At the 50th FY2021 NRA Commission Meeting (December 8, 2021), the NRA agreed to launch the "Study Team for Technical Evaluation of Japan Electric Association Code for Digital Safety Protection System" for technical evaluation of the "Code on Applying Digital Computer for Safety Protection System (JEAC4620-2020)" and "Guide on Verification and Validation (V&V) of Digital Safety Protection System (JEAG4609-2020)" of Japan Electric Association. The study team meeting was held once (January 25, 2022) to date.

(4) Collection and Analyses of Domestic and Overseas Accidents/Failures Information and Natural Phenomena

(a) Collection and Analyses of Domestic and Overseas Accidents/Failures Information

To incorporate the latest scientific and technological knowledge and findings, the NRA is collecting and analyzing domestic and overseas information on accidents and failures and conducting two-stage screening on the basis of the necessity of regulatory intervention. In FY2021, 146 cases of primary screening were conducted, including open information on accidents and failures collected in Japan and abroad. Information on accidents and failures was also collected in collaboration with international organizations and foreign countries. The results consisted of 145 cases which were out with the primary screening and one case which was transferred to the secondary screening. Three cases were out with the secondary screening, and one case is still under examination. In addition, regulatory intervention is being prepared for two cases.

The results of information screening related to domestic and overseas accidents and failures addressed at the meetings of the Technical Information Committee were reported to the Reactor Safety Examination Committee (RSEC) and the Fuel Safety Examination Committee (NFSEC), both of which consist of external experts, for soliciting advice (at the 7th Reactor Safety Subcommittee Meeting / the 1st Nuclear Fuel Safety Subcommittee Meeting (May 21, 2021), the 8th Reactor Safety Subcommittee Meeting /the 2nd Nuclear Fuel Safety Subcommittee Meeting (September 16, 2021) and the 9th Reactor Safety Subcommittee Meeting / the 3rd Nuclear Fuel Safety Subcommittee Meeting (January 14, 2022)).

(b) Collection and Analysis of Information on Natural Phenomena Inside and Outside Japan

The Secretariat of the NRA has participated in governmental committees and academic meetings to collect and analyze information on domestic and overseas natural phenomena.

Using detailed data on the summary report of the "Study on Models of Massive Earthquakes along the Japan Trench and Chishima Trench" (April 2020) released by the Cabinet Office in December 2020, the Secretariat of the NRA analyzed earthquake size, etc., discussed whether regulatory intervention is needed, and presented a report at the 45th Technical Information Committee Meeting (April 14, 2021). Focusing on the seismic motion and source characteristics of the February 2021 earthquake off the coast of Fukushima Prefecture, the Secretariat of the NRA collected reports from the Headquarters for Earthquake Research Promotion and the Annual Meeting of the Seismological Society of Japan, etc., conducted an analysis, and submitted a report at the 54th FY2021 NRA Commission Meeting (December 22, 2021).

In addition to the above, the Secretariat of the NRA examined whether regulatory intervention is needed regarding Pilarczyk et al.'s findings on tsunami deposits at Kujukurihama, Chiba Prefecture and the estimated tsunami wave source based on them, Matsubara et al.'s findings on the renewal of the top surface shape of the Philippine Sea plate in the Tokai region, and Takarada et al.'s distribution map of Ito pyroclastic flow deposit of Aira caldera, etc. The NRA received relevant reports at the 50th Technical Information Committee Meeting (October 14, 2021), the 51st Technical Information Committee Meeting (January 20, 2022), and the 52nd Technical Information Committee

Meeting (March 10, 2022), respectively.

(c) Review of Subcommittees on Volcanic Hazards of RSEC and NFSEC

The Secretariat of the NRA evaluated the results of volcanic activity monitoring in FY2020 by Kyushu Electric Power Co., Inc. at the Sendai NPS and Genkai NPS using the report from the Subcommittee on Volcano Monitoring of RSEC (regarding "measure to judge significant changes in observation data" during volcano monitoring[26]). At the 10th Meeting of Subcommittees on Volcano Monitoring of RSEC and NFSEC (October 1, 2021), the evaluation by the Secretariat of the NRA concluding the adequacy of the assessment by Kyushu Electric Power Co., Ltd. that there is no change in the activity situation of the target caldera volcano was confirmed valid. At the subcommittee meeting, the Secretariat of the NRA also explained the newly added investigation and review items related to the knowledge about volcanic events, and reported technical information to be addressed in relation to volcanic events and shared at the Technical Information Committee Meetings.

(d) Review at the Subcommittees on Earthquake and Tsunami Hazards of RSEC and NFSEC

At the 1st Meeting of Subcommittees on Earthquake and Tsunami Hazards of RSEC and NFSEC (May 18, 2021), the Secretariat of the NRA explained the research and review items related to the knowledge about earthquakes and tsunamis, and reported technical information to be addressed in relation to earthquake and tsunami events, shared at the Technical Information Committee Meetings in the most recent year, including analysis results using the data released to the public regarding the "Study on Models of Massive Earthquakes along the Japan Trench and Chishima Trench (Summary Report)" by the Cabinet Office, mentioned in (2) above. The adequacy of the collection and analysis results of the above information was confirmed at the subcommittee meeting.

Section 3 Steadfast Implementation of the Revised Reactor Regulation Act

1. Continual Improvements in Operation of Nuclear Regulatory Inspections

To continuously improve the nuclear regulatory inspection system which has been in operation since April 2020, the NRA established the "Information Exchange Meeting on the Inspection Program" for exchanging opinions with external experts and nuclear operators, etc. The meeting was held three times in FY2021 and opinions were exchanged regarding the implementation status of nuclear regulatory inspections, the operation status of the corrective action program (CAP[27]) system by operators and significance level evaluation methods for nuclear fuel cycle facilities, etc.

Revisions of the guides for institutional improvement based on the opinion exchange meetings in FY2020 and operational performance were agreed at the 3rd FY2021 NRA

[26] A summary of criteria for judging that observation data in volcano monitoring has changed significantly compared to the long-term trend from the past, and it still continues. It was compiled at the 8th Meeting of Subcommittees on Volcano Monitoring on March 6, 2020, and reported at the 72nd FY2019 NRA Commission Meeting (March 18, 2020).

[27] Corrective Action Program

Commission Meeting (April 14, 2021) and the 20th FY2021 NRA Commission Meeting (July 14, 2021).

At the 3rd FY2021 NRA Commission Meeting (April 14, 2021), operations were changed so that events likely classified as inspection findings must be reported promptly to the NRA chairman, etc. in response to the delayed report from the Secretariat to the NRA about the unauthorized use of an ID card at the TEPCO's Kashiwazaki-Kariwa NPS. In addition, the inspectors at the NRA Regional Offices are obligated to inspect physical protection and patrol the premises in addition to the inspection of nuclear facility safety and radiation safety.

As efforts to improve the competence of inspectors, training and education necessary for acquiring inspector qualifications, etc. were implemented in FY2021 and information such as inspection practices and inspection results was disseminated through the inspectors meeting. The work involving the movement of staff, such as visits to inspection sites by the managerial officers of the Secretariat, was carried out within the scope of no impact in consideration of the spread of COVID-19.

In addition, public meetings were held with the aim of asking nuclear operators to participate as necessary to confirm the facts of matters noticed in inspections. In FY2021, the public meeting to investigate and analyze the cause of the rewriting of borehole map data at the Tsuruga NPS Unit 2 was held twice.

To utilize the probabilistic risk assessment models developed by operators for the nuclear regulatory inspections, the appropriateness of the probabilistic risk assessment model of the Ikata NPS Unit 3 related to the containment functional failure for internal events under full-power operation was checked by the NRA, and the results were reported at the 20th FY2021 NRA Commission Meeting (July 14, 2021).

2. Reinforcement of Quality Management

At the 50th FY2019 NRA Commission Meeting (December 25, 2019), an “NRA Rule on Standards for Systems Necessary for Quality Management relating to Work to Ensure Safety of Nuclear Facilities” and its interpretation were formulated to reinforce the quality management system based on the Act for Partial Revision of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material, and Reactors on April 1, 2020, and enforced on the same day as the new inspection system. This requires nuclear operators to develop a system necessary for quality management related to the work for maintaining the safety of nuclear facilities for permission of installation or operation, etc., and take measures for applying approvals by clarifying the quality management system in operational safety program before commencing the work of installation. The NRA is proceeding with the smooth transition to the new system by properly granting approval of operational safety program.

Regarding nuclear fuel facilities, etc., the NRA received notifications of change in basic design permission in conjunction with the revision from 231 nuclear fuel cycle facilities (including nuclear fuel material usage facilities not subject to Article 41 of the Order) since April 1, 2020, and confirmed details of these notifications. The NRA also received applications for approval of operational safety programs from 39 facilities requiring changes in these programs, and granted approval to all those facilities within FY2021.

Chapter 3 Promotion of Nuclear Security Measures and Steadfast Implementation of Safeguards

○ **Summary of Chapter 3**

(Promotion of Nuclear Security Measures)

To enhance nuclear security, the NRA has been steadfastly streamlining the institutional system of nuclear facilities, such as the enhancement of measures against insider threats (checking the trustworthiness of individuals and installing monitoring equipment in protected areas) and continuously improving cyber security measures based on IAEA recommendations (INFCIRC/225/Rev.5). In March 2022, regulatory requirements regarding the physical protection measures for nuclear materials were partially revised to reinforce cyber security measures.

In FY2021, the NRA strictly reviewed applications for permission to change physical protection programs for commercial power reactors and other nuclear facilities and generally implemented the originally planned nuclear regulatory inspections on schedule. The NRA has also steadily implemented radioisotope regulations in an attempt to establish the regulations through on-site inspections to ascertain the security of specific radioisotopes.

Moreover, to prevent nuclear security incidents and respond promptly in the event of any such incident, the NRA has stationed inspectors for nuclear security at the NRA Regional Offices and planned to facilitate highly confidential networks between the headquarters of the Secretariat of the NRA and NRA Regional Offices as well as other work environment improvements.

(Steadfast Implementation of Safeguards)

The IAEA’s report regarding safeguards activities in Japan in 2020 concluded that all nuclear material remained in peaceful activities (Broader Conclusion).

Regarding TEPCO’s Fukushima Daiichi NPS Units 1 to 3, where normal inspections cannot be carried out, the NRA has taken necessary verification activities including the completion of secondary verification of fuel assemblies after transferred from the spent fuel pool of Unit 3 to the common spent fuel pool in addition to additional safeguards implemented by previous fiscal years through continuous consultation with the IAEA.

In response to the IAEA’s efforts to maintain efficient and effective state level safeguards with limited resources, the NRA discussed and consulted with the IAEA regarding facility-type-specific safeguards approaches to be applied at each nuclear facility in Japan and began applying them to some facilities. The NRA facilitated the international community's understanding of Japan's safeguards and contributed to strengthening and improving the efficiency of international safeguards through participating in international safeguards-related conferences and support for education of safeguards personnel and development of safeguards technologies. In particular, in light of the IAEA's policy of conducting inspections as planned despite the COVID-19 pandemic, the NRA coordinated with the relevant parties in order for the inspections to be carried out based on the IAEA notifications.

The NRA also provided necessary guidance and supervision for the designated organization for information processing and implementing safeguards inspection, which plays an essential role in the National System of Safeguards of Japan, to ensure proper performance of its duties.

Section 1 Promotion of Nuclear Security Measures

1. Rigorous and Proper Implementation of Regulations on Nuclear Security

(1) Rigorous and Proper Implementation of Regulations on Physical Protection

(a) Rigorous Implementation of Nuclear Regulatory Inspection relating to Physical Protection

The NRA conducts nuclear regulatory inspections related to physical protection based on the Reactor Regulation Act. In FY2021, 117 nuclear regulatory inspections including the operation of the Confirmation System of Trustworthiness, and the confirmation of the status of initial responses in physical protection training and information system security measures were strictly conducted based on the annual nuclear regulatory inspection plan established in May 2021.

To prevent nuclear security incidents and respond promptly in the event of any such incident, the NRA has stationed inspectors for nuclear security at the NRA Regional Offices and planned to facilitate highly confidential networks between the headquarters of the Secretariat of the NRA and NRA Regional Offices as well as other work environment improvements. The necessary expenses were included in the supplementary budget for FY2021 and the budget for FY2022.

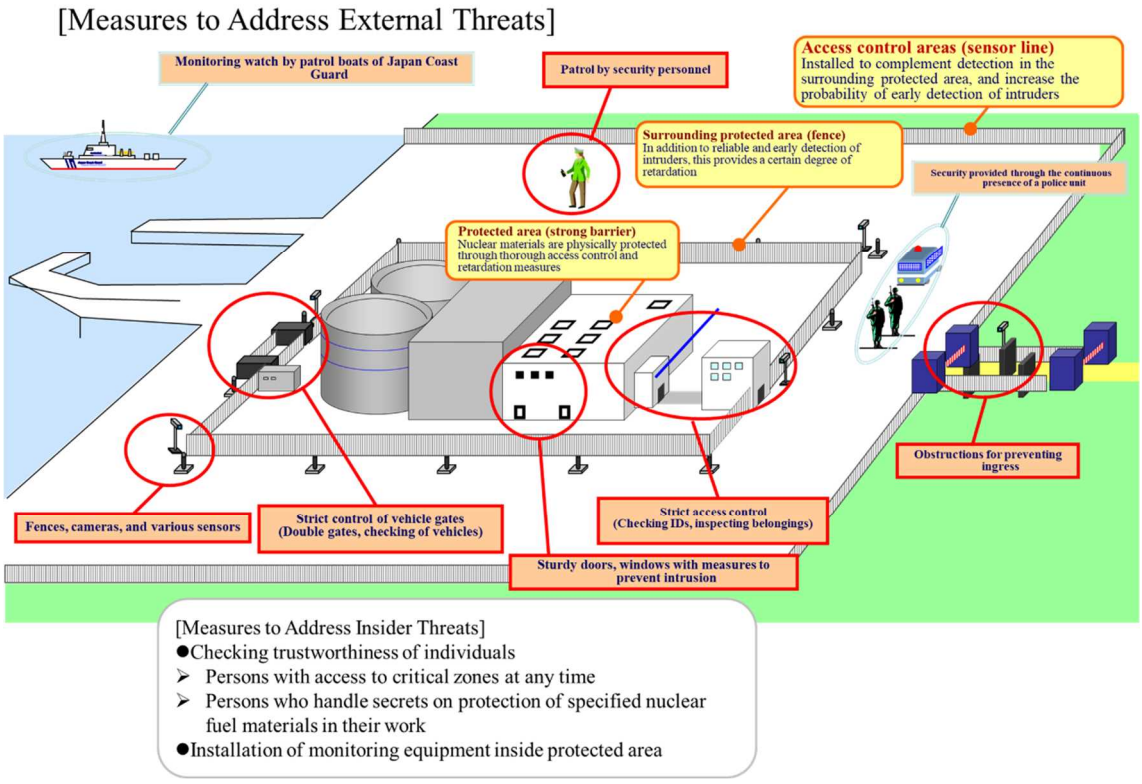


Figure 3-1 Overview of Protection Measures for Nuclear Facilities

(b) Rigorous Review of Physical Protection Programs

The NRA reviews physical protection programs required for protecting specified nuclear fuel materials under the Reactor Regulation Act. In FY2021, the NRA approved 62 applications to change physical protection programs.

Kansai Electric Power Co., Ltd. submitted an application for approval to change physical protection programs at the Takahama PS, based on the provisions in Paragraph 1 of Article 43-3-27 of the Reactor Regulation Act, dated February 16, 2021 (with revisions dated March 3, 2021 and April 15, 2021), and a report evaluating the effectiveness of protection measures relating to cyber attacks to the reactor shutdown equipment outside the central control room. At an Extraordinary Meeting of the 4th 2021 NRA Commission Meetings (April 20, 2021), the NRA confirmed a report of review results of this application from the Secretariat of the NRA and granted approval through the necessary procedure.

(c) Efforts for Improving Physical Protection Training

Of the initial responses that operators should take in the event of a physical protection emergency, determination of whether it is an information collection level event or alert level event[29], implementation of measures such as evacuation instructions and sharing of information between the Secretariat of the NRA and security organizations are especially important. In FY2021, the NRA focused on checking the achievement status of these responses in nuclear regulatory inspections. Using the NRA's Emergency Response Center (ERC), the NRA participated in simulated physical protection training provided by operators and issued technical advice as well as confirming the approach of the Secretariat of the NRA to nuclear safety.

(2) Steady Implementation and Establishment of Protection Regulations for Radioisotopes

The NRA requires operators that handle highly hazardous radioisotopes (herein after referred to as "specified radioisotopes") to take security measures to prevent theft under the Radioisotope Regulation Act and verifies that protection measures have been in place through on-site inspections of the facility where specified radioisotopes were handled. In FY2021, The NRA carried out 126 on-site inspections relating to security of specified measures of specified radioisotopes.

In FY2021, the periodical course for specified radioisotope security managers was provided twice by registered periodic training organizations for specified radioisotope managers.

[29] In the NRA Guide for Emergency Preparedness and Response, an "alert-level event" is defined as: "a stage where, at the time, there are no effects on the general public due to radiation and no imminent risk of that occurring, but an abnormal event has occurred at a nuclear facility, or there is a risk of such an event and thus it is necessary to start gathering information, preparing for emergency monitoring (i.e., environmental radiation monitoring performed when there is an abnormal release of radioactive material or radiation, or a risk of that happening) and preparing for protective actions such as evacuation of persons requiring evacuation in a facility site emergency."

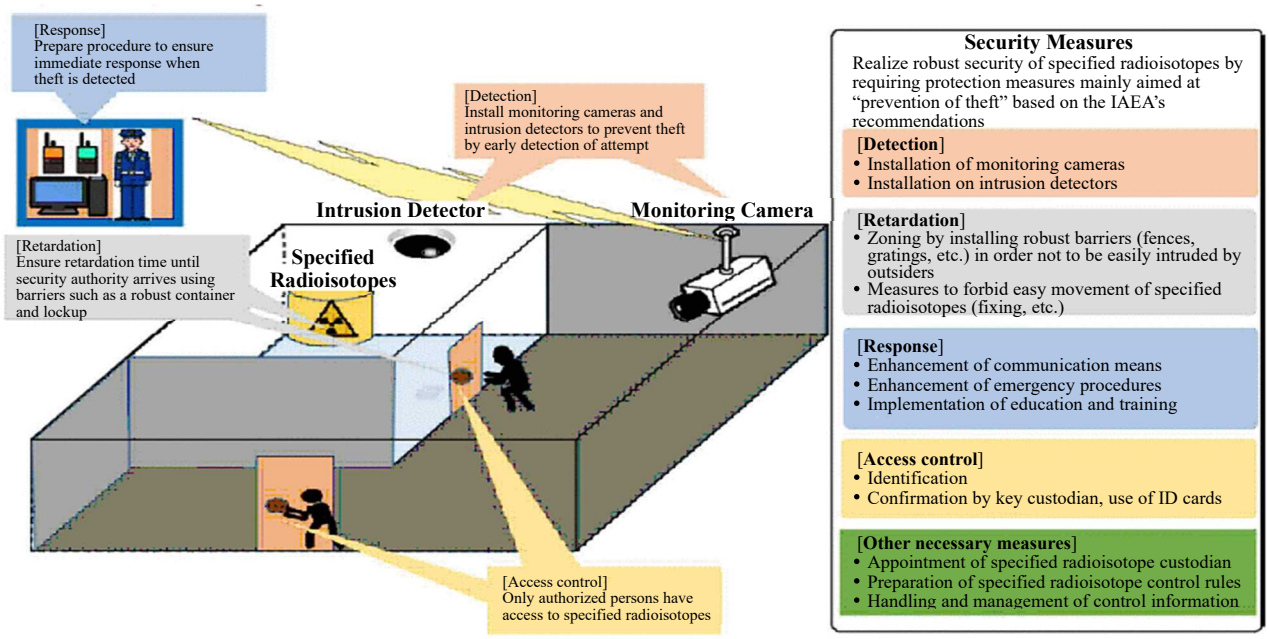


Figure 3-2 Protection Measures for Specified Radioisotopes

2. Response to Nuclear Security Challenge

(1) Fostering a Nuclear Security Culture

The NRA formulated a "Code of Conduct on Nuclear Security Culture" in January 2015 as a guideline to foster and maintain a nuclear security culture based on the "Organizational Philosophy of the NRA" developed in January 2013. According to this guideline, the NRA continued to implement training relating to nuclear security culture, targeting newly hired personnel and persons expected to take the post of inspector in FY2021.

To encourage nuclear operators to foster a nuclear security culture, the NRA reminded the executives of operating entities of the critical importance of nuclear security culture in cooperation with security organizations.

(2) Enhancement of Cyber Security Measures

In nuclear regulatory inspections, the NRA focused on checking progress in improvement of security plans for information system taking account of the "Guidelines for Security Measures for Nuclear Facility Information System" (drawn up in March 2018, hereinafter referred to as "Guidelines") as reference materials for continuous improvement of cyber security measures by operators themselves. In light of the possible threats such as sabotage to information systems of nuclear facilities (formulated in October 2018), the NRA is conducting review of applications submitted by operators for approval to change security plans based on the revised Examination Standard for Security Plan (April 2019).

The suggestion was made by IAEA's International Physical Protection Advisory Service (IPASS) follow-up mission (November 2018) to make provisions in the Guidelines to be incorporated in the Review Standards, and the NRA recognized that information system security measures in the Guidelines were taking root among nuclear operators. Thus, the NRA decided to revise the Review Standards by incorporating some

provisions in the Guidelines. The NRA decided to proceed with the revision of the criteria for physical protection measures for commercial power reactor and reprocessing facilities, which are deemed to have a significant impact in the event of sabotage or other vandalism on information systems for nuclear facilities. This revision was discussed seven times since an Extraordinary Meeting of the 4th FY2021 NRA Commission Meeting (April 20, 2021), and a draft revision of part of the Review Standards for physical protection measures for nuclear material was agreed at an Extraordinary Meeting of the 55th FY2021 NRA Commission Meeting (December 22, 2021). Following the feedback from operators, the partial revision of the Review Standards was approved at an Extraordinary Meeting at the 76th FY2021 NRA Commission Meeting (March 30, 2022).

To further strengthen cyber security countermeasures, the NRA provided nuclear operators with technological advice in their physical protection training.

(3) Review of Nuclear Security Measures during Transportation

The Reactor Regulation Act requires that nuclear operators take protection measures such as locking and sealing transport containers storing specified nuclear fuel materials to transport them outside the factory or operator's premises and before starting transportation, clarify who oversees transportation, conclude an agreement among the parties concerned and obtain confirmation from the NRA.

In FY 2021, the NRA confirmed 13 cases related to the conclusion of transportation agreements based on relevant regulations, etc., and exchanged opinions with related ministries and agencies regarding nuclear security countermeasures during transportation.

3. Participation in International Conferences

To continually improve regulations for nuclear security measures, the NRA makes it its policy to incorporate the latest knowledge relating to nuclear security, obtained through international conferences and so on, into applicable laws and regulations.

The NRA participated in conferences on nuclear security scheduled to be held by international organizations in FY2021via an online conference system, continuing from the previous fiscal year, rather than face-to-face due to the effects of COVID-19 transmission, collected the latest knowledge relating to the physical protection of nuclear materials and reflected Japan's experiences and opinions in international discussions. The NRA contributed in particular to the review of the IAEA Nuclear Security Fundamentals and Nuclear Security Recommendations at the Meeting of Nuclear Security Guidance Committee (NSGC) (June, November to December, 2021) and discussions at the Legal and Technical Experts Meeting for Fundamental Principles (January 2022).

Although the Conference of the Parties to the Amended Convention on the Physical Protection of Nuclear Material was scheduled to be held to review the convention's implementation situation and its adequacy in 2021, five years after the convention went into effect, it was postponed due to the impact of COVID-19 and held from March 28 to April 1, 2022. In addition, the NRA also participated in discussions at the regional meeting (December 2021) held in accord with the conference and at the Meeting of the Chair Group of Friends (January and February 2022).

The NRA dispatched an official from the Secretariat of the NRA as a member of the Steering Committee of the International Working Group for the International Initiative on Mitigating Insider Threat (INFCIRC/908) and helped with activities to promote efforts to mitigate insider threats internationally through dialog at Steering Committee meetings (April 2021, January 2022), security culture working group activities, outreach activities (June 2021) and regional meetings (September 2021).

Section 2 Steady Implementation of Safeguards

1. Steady Implementation of Safeguards Activities in Japan

In Japan, limiting the use of nuclear power to peaceful purposes is a fundamental policy manifested in the Atomic Energy Basic Act. Japan has accordingly signed the Treaty on the Non-Proliferation of Nuclear Weapons and also concluded a safeguards agreement (Japan-IAEA Safeguards Agreement[30]) and the Additional Protocol with the IAEA based on this treaty. Bilateral nuclear agreements to promote cooperation concerning the peaceful use of nuclear power have also been concluded with 14 countries and 1 international organization. By complying with these international commitments in good faith, Japan is demonstrating to the international community that it is limiting the use of nuclear power to peaceful purposes.

The NRA implements the prescribed regulatory controls in Japan and coordinates on operations with the IAEA and other organizations in Japan and overseas in order that Japan can fulfill its obligations under its international commitments and maintain the trust of Japan by the international community pertaining to the peaceful use of nuclear power.

(1) Fulfilling the Japan-IAEA Safeguards Agreement

(a) Permission for the Use of Internationally Controlled Material and Approval of Provisions for Examination of Accounting

As a general rule under the Japan-IAEA Safeguards Agreement, all nuclear materials possessed in Japan are subject to this agreement. Thus, even if nuclear fuel materials not subject to safety controls are used, they will be subject to permission or approval to use as safeguarded material. In FY2021, there were 35 cases in which permission or approval to the use of internationally controlled material was granted and 437 cases in which a notification of change was submitted. To ensure proper accounting for and control of internationally controlled material in Japan, nuclear operators including the users of such materials (hereinafter referred to as "internationally controlled material users") are obligated to stipulate their accounting provisions. In FY2021, approval was

[30] An agreement concluded between the Japanese government and the IAEA to implement the provisions of Article 3(1) and (4) of the Treaty on the Non-Proliferation of Nuclear Weapons

granted to 38 cases of accounting provisions and approval of changes to 154 cases of accounting provisions.

(b) Accounting Reports, Information Provision such as Facility Design and Declarations Based on the Additional Protocol

Nuclear material accounting is an important basic step in Safeguards. Internationally controlled material users are obligated to report the current inventory and changes of inventory of nuclear materials to the NRA in accordance with the Reactor Regulation Act. Once the submitted accounting information is processed at the Nuclear Material Control Center, which is specified as an information processing organization under the Reactor Regulation Act, the NRA compiles it into an accounting report and submits it to the IAEA through the Ministry of Foreign Affairs on a timely basis. In FY2021, 2,144 individuals were required to submit accounting reports. Table 3-1 shows the number of reports by the type.

In addition, the NRA provides design information relating to facilities subject to the Safeguards Agreement and other information required to implement safeguards and submits a declaration based on the Additional Protocol to the IAEA through the Ministry of Foreign Affairs.

Table 3-1 Number of Accounting Reports for FY2021
(April 1, 2021 - March 31, 2022)

Type	No. of cases
Inventory change reports	844
Material balance reports	373
Physical inventory listings	4,363
Nuclear fuel material management reports	3,663

(c) Verification Activities

The IAEA conducts on-site verification activities, including inspections of facilities, based on information submitted by Japan. Of these on-site verification activities, inspections are carried out after going through communications and adjustments by the NRA and at the same time as Japan's safeguards inspections are carried out, in the presence of officials of the national government or of an organization designated by the NRA. Most of the safeguards inspections are conducted by the Nuclear Material Control Center, which has been designated as an organization for implementing safeguards inspection under the Reactor Regulation Act, according to instructions issued by the NRA. However, the IAEA’s verification of facility design information is conducted together with on-site inspections conducted by the NRA itself, in the presence of NRA staff. The IAEA’s complementary access under the Additional Protocol is attended by the staff of the NRA and the Ministry of Foreign Affairs. In light of the IAEA’s policy of conducting inspections as planned, despite the impact of COVID-19, the NRA coordinated with the relevant parties and the inspections were carried out based on the IAEA notifications. Table 3-2 shows the record of safeguards inspections carried out by the State in FY2021.

Table 3-2 Results of Safeguards Inspections Conducted by Government Officials in FY2021
(April 1, 2021 - March 31, 2022)

Type	Nuclear Regulation Authority	Nuclear Material Control Center	Ministry of Foreign Affairs
Safeguards inspections	36 person-days	1,835 person-days	
Design information verification	91 person-days		
Complementary access	32 person-days		24 person-days

*Including independent safeguards inspections

(d) Coordination for Facilitating Implementation of Safeguards

To facilitate the implementation of safeguards, the NRA has held meetings with the IAEA with the attendance of relevant domestic organizations for the purpose of sharing information on the state of facilities, investigating issues that arise when safeguards are implemented and making adjustments. Despite the difficulty of holding meetings as before due to the effect of COVID-19, a total of 10 working group meetings participated by the specified facility groups were held (three of which were held online) in FY2021 to review and adjust safeguards related issues.

(e) Treatment of Safeguards Equipment in Terms of Safety Regulations

To prevent the occurrence of safety problems caused by safeguards equipment such as monitoring cameras installed in nuclear facilities in line with the implementation of the Japan-IAEA Safeguards Agreement, close coordination was made among the IAEA, nuclear operators, relevant NRA Secretariat departments and others.

(f) IAEA's Safeguards Conclusions

At the 8th FY2021 NRA Commission Meeting (May 19, 2021), the NRA received from its Secretariat the results of 2020 safeguards activities in Japan and reported the results to the IAEA to contribute to the IAEA's assessment of Japan's safeguards activities. The IAEA draws a conclusion on safeguards based on the evaluation of all information obtained through safeguards activities carried out every year by the contracting parties to the Safeguards Agreement and reports it at the IAEA's Board of Governors meeting in June of the following year. For Japan, as a result of the safeguards activities, the IAEA found no indication of the diversion of declared nuclear material from peaceful nuclear activities and no indication of undeclared nuclear material or activities. On this basis, the IAEA also concluded in 2020 that all nuclear material remained in peaceful activities (Broader Conclusion). Accordingly, this Broader Conclusion has been adopted continuously for 18 years since the results of the implementation of safeguards in 2003 were obtained.

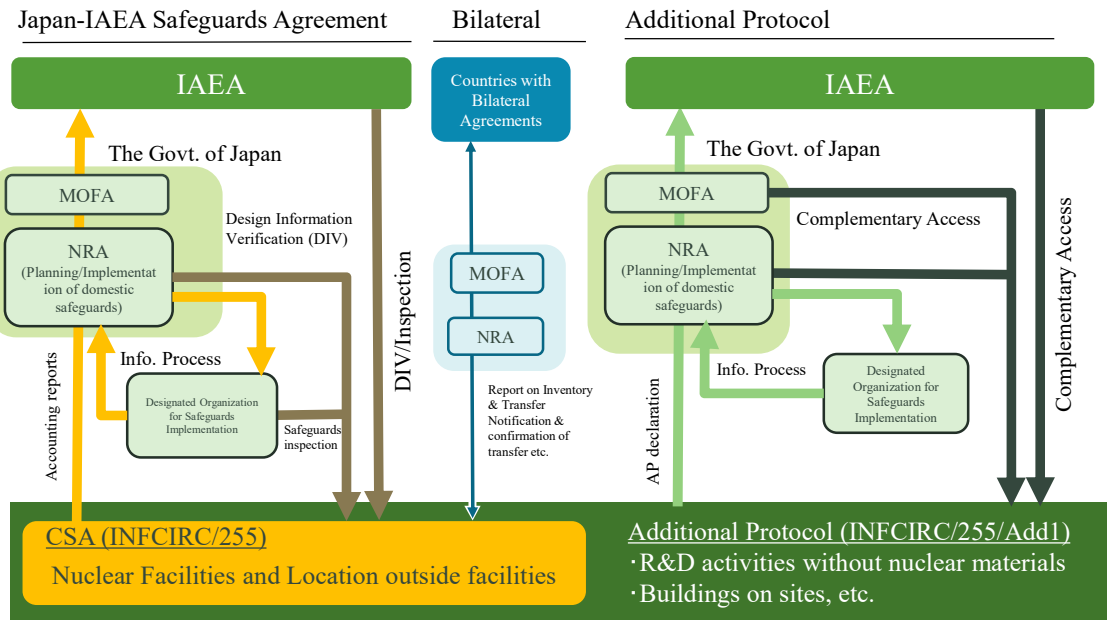


Figure 3-3 Safeguards Implementation Arrangement

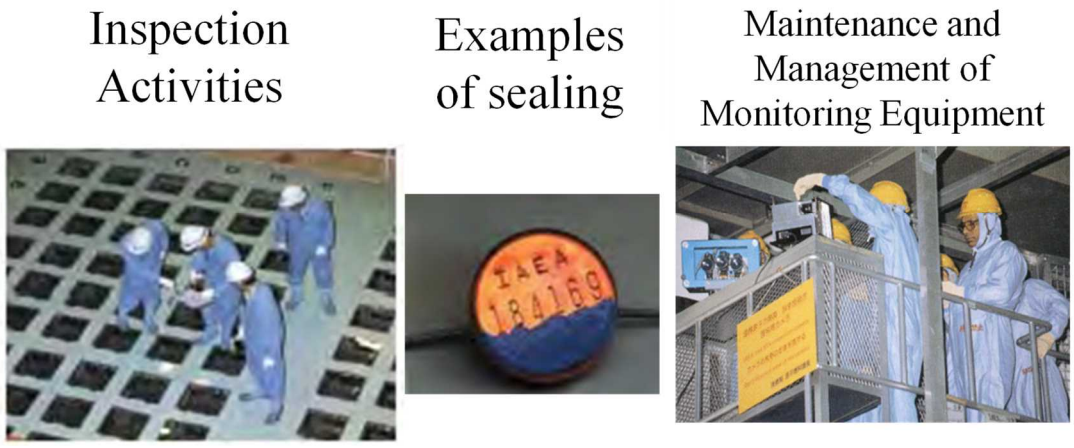


Figure 3-4 Safeguards-related Activities

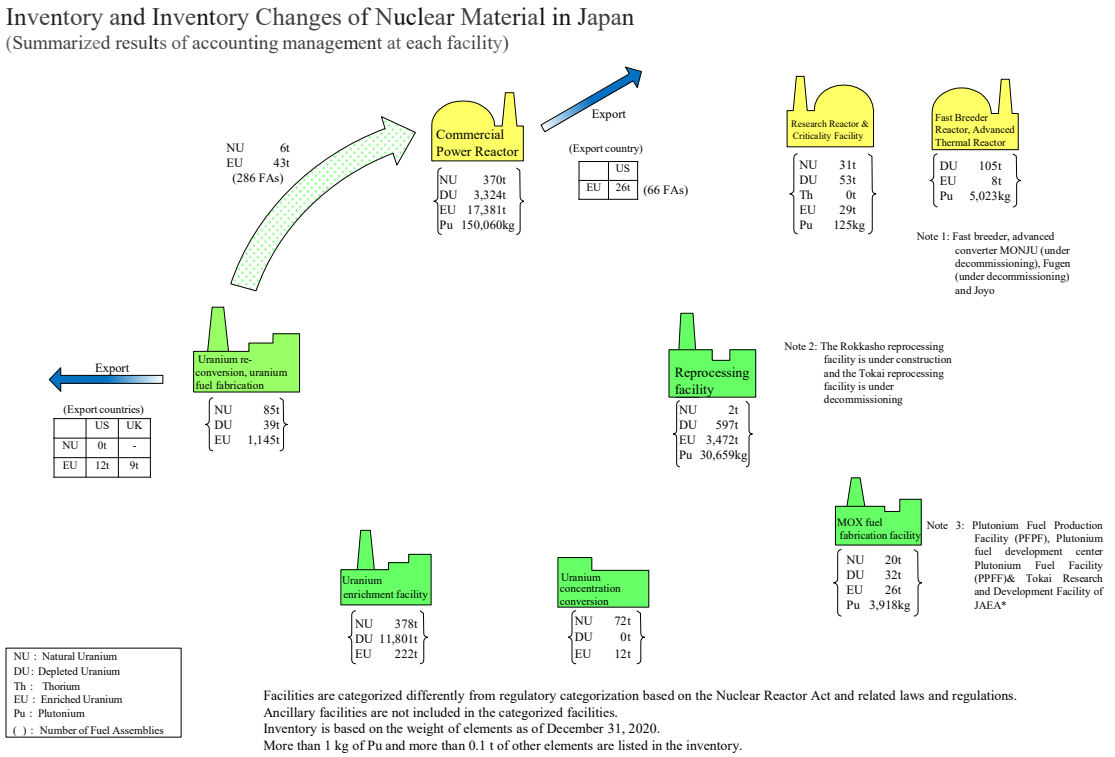


Figure 3-5 Amount of Nuclear Materials in Japan

(2) Implementation of Procedures for Internationally Controlled Material on the Basis of Bilateral Nuclear Agreements

Japan has concluded bilateral nuclear agreements with 14 countries and one international organization, and has undertaken commitments to use nuclear source materials, nuclear fuel materials and moderator materials which have been transferred under these agreements and nuclear fuel materials produced as a result of using these transferred materials, for only peaceful purposes and to carry out procedures applicable to items subject to these agreements. In FY2021, “the issue to define the internationally controlled material based on the rule of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors (Public Notice)” was partially revised as the Japan-UK Nuclear Co-operation Agreement was modified and enforced in September 1, 2021. The NRA handled nine cases of confirmation pertaining to the management of the country origin of the nuclear materials transferred from other contracting parties and one case of confirmation as part of efforts to manage the country origin of nuclear materials transferred to other contracting parties in FY2021 according to the bilateral nuclear agreements concluded by Japan. In addition, with the support of the Nuclear Material Control Center, the NRA reported 14 inventory listings to the IAEA.

2. Safeguards at TEPCO’s Fukushima Daiichi NPS

Normal on-site verification activities have been carried out by the IAEA for all nuclear materials in reactors except Units 1 to 3 at the Fukushima Daiichi NPS. Normal inspections cannot be carried out for Units 1 to 3 reactors, due to the difficulty of entering these reactors. Therefore, through consultations with the IAEA and relevant domestic organizations, a continuous monitoring system composed of surveillance

cameras and radiation monitors, and special additional verification activities applicable only to this NPS site have been introduced, contributing to building a framework to allow the IAEA to verify that no undeclared nuclear material has been moved from Units 1 to 3. In FY2021, the IAEA completed re-verification activities for fuel assemblies transferred from the spent fuel pool of Unit 3 to the common spent fuel pool.

Regarding the Fukushima Task Force Meeting, normally held twice a year at the IAEA Headquarters, the meeting in the first half year could not be held due to the spread of COVID-19, but the meeting in the second half year was held at the IAEA Headquarters in November 2021. Discussions at the meeting included accounting management and safeguarding methods for the temporary storage facility to be constructed on the NPS site and information on on-site activities that would be needed to implement safeguards was shared.

Complementary access, which is a special additional verification activities applied solely to this NPS site, was conducted six times in FY2021.

3. New Safeguards Inspections

To maintain efficient and effective safeguards with limited resources while utilizing the experience of safeguards implementation and new technologies, the IAEA has formulated a "State Level Safeguards Approach" for each country taking into account the status of nuclear activities and technical capacities of each country. Because the IAEA adopted the same approach to Japan, the NRA has continuously examined and discussed with the IAEA about facility-type-specific inspection procedures based on that approach at joint working group meetings since FY2019. In FY2021, an agreement was reached with the IAEA regarding new inspection procedures based on the same approach for the TEPCO's Fukushima Daiichi NPS and R&D facilities including research reactors and criticality facilities and use of those procedures was started.

The IAEA expressed its intention of enhancing verification activities for approximately 200 "locations outside facilities"[31] in Japan and recommended Japan's independent implementation of safeguards inspections to complement those verification activities. Accordingly, to improve the quality of accounting control at "locations outside facilities" and the reliability of Japan's safeguards activities, the NRA implemented its own safeguards inspections, independent of IAEA inspections, at one "location outside facilities" in FY2021 based on the implementation guideline for domestic safeguards inspections (NRA decision on February 19, 2020).

4. Information Transmission and Human Resource Development related to Japan's Safeguards Activities

(1) Transmission of Information on Japan's Safeguards Activities

The NRA participated in the European Safeguards Research and Development Association (ESARDA) (April 2021) and the 2021 International Forum on Peaceful Use of Nuclear Energy, Nuclear Non-Proliferation and Nuclear Security (December 2021) to transmit information on Japan's safeguards and increase understanding within the international community.

[31] These facilities include structures or location that do not fall under "the facilities (nuclear reactor, criticality facility, conversion plant, fabrication plant, reprocessing plant, isotope separation plant or independent storage facility)" and normally use nuclear material less than 1 effective kilogram. Mainly "usage facilities" in the classification of regulations under the Reactor Regulations Act correspond to the "locations outside facilities."

(2) Support for the Implementation of Safeguards by the IAEA and Foreign Countries

The technological development required for the IAEA to implement safeguards has been supported by the key IAEA member states. Japan has proactively contributed to reinforcing technological capabilities of the IAEA and member states for strengthening international safeguards through frameworks such as the Japan Support Programme for Agency Safeguards (JASPAS). The program covers a broad array of specific support plans including participation in the IAEA Network of Analytical Laboratories where environmental samples collected by IAEA inspectors are analyzed and training opportunities are provided for IAEA inspectors and safeguards officials of member states. The NRA has made overall coordination of the support program and provided necessary funds. As of the end of FY2021, 29 projects are in progress. In an online regional training course for the State System of Accounting for and Control of nuclear material jointly held by the Japan Atomic Energy Agency and the IAEA, the NRA presented Japan's accumulated knowledge.

5. Guidance and Supervision of Designated Information Processing Organizations and Designated Organizations Implementing Safeguards Inspections, etc. under the Reactor Regulation Act

The Nuclear Material Control Center is required to carry out its operations in an appropriate manner as the designated information processing organization and designated organization implementing safeguards inspections, etc. under the Reactor Regulation Act. To ensure the proper performance, the NRA urges the Nuclear Material Control Center to reinforce its safeguards implementation system and checks compliance with related provisions of the Reactor Regulation Act and information security reinforcement situations.

Section 3 Reinforcement of Interface for Nuclear Safety, Nuclear Security and Safeguards

With the aim of harmonizing nuclear Safety, Security and Safeguards (3S) at a higher level, the NRA clarified related issues and discussed the direction to head at the 5th FY2018 NRA Commission Meeting (April 25, 2018). Continuous study is intended on this matter.

When an application for permission or approval related to safety or nuclear security is filed, the responsible section must share the result of confirmation by the applicant about adverse effects on other measures with related departments, and hold interviews, etc. as required with the operator in an attempt to eliminate mutually adverse effects as much as possible.

To date, the inspectors of the NRA Regional Offices have shared information with responsible departments when noticing any matters about nuclear security and safeguards during nuclear regulatory inspection. The security or safeguards inspector must share information with the responsible departments as necessary when noticing any matters related to other measures. From FY2021, the inspectors of the NRA Regional Offices were assigned with new tasks of confirming the site including the confirmation of the Corrective Action Program (CAP) related to physical protection measures for nuclear material and patrol the site. They also need to share information with the responsible sections if noticing any matter related to these sections.

For those engaged in the work that requires harmonization of 3S, such as examinations and inspections related to nuclear safety, the trustworthiness and reliability of officials dealing with secrets on physical protection has been checked sequentially to ensure appropriate access to documents related to secrets on physical protection based on the "Instructions on Confirmation." Furthermore, it issues alerts to the departments responsible for operating the trustworthiness and reliability check system appropriately, and provides education on physical protection for inspectors having undergone trustworthiness and reliability check.

To make the operation more effective, the NRA collects case studies and plans to enhance the 3S content in the training provided by the Human Resource Development Center.

Chapter 4 Ensuring the Safety of Decommissioning of TEPCO's Fukushima Daiichi NPS and Investigating the Causes of the Accident

○ **Summary of Chapter 4**

(Oversight of Efforts to Decommission Reactors of TEPCO's Fukushima Daiichi NPS)

In FY2021, the NRA rigorously reviewed TEPCO's applications for approval to change the "Implementation Plan pertaining to Specified Nuclear Facility of the Fukushima Daiichi NPS" and approved 8 cases.

The NRA reviewed the concept of seismic design applied to the facilities at the Fukushima Daiichi NPS based on the assessment of the earthquake off the coast of Fukushima Prefecture on February 13, 2021**.** It was then determined to set ground motion and necessary countermeasures according to facility characteristics by classifying them into four seismic classes according to the assessed exposure caused by the loss of safety function due to an earthquake, service duration, and impact on risk reduction activities as well as considering factors such as impact on decommissioning activities. The NRA requested TEPCO to re-assess the seismic classes of facilities including those already applied as of September 8, 2021.

In FY2021, an application for approval to change the Implementation Plan for facility installation related to the discharge of ALPS-treated water into the sea was filed by TEPCO based on the Basic Policy of Handling of ALPS-treated water at TEPCO's Fukushima Daiichi NPS decided at the 5th Ministerial Meeting on Measures for Decommissioning Contaminated Water and Treated Water (April 13, 2021). It is under review at a public meeting.

The efforts of TEPCO to comply with the Implementation Plan approved thus far are under the NRA's oversight through operational safety inspections, pre-service inspections, welding inspections, periodic facility inspections, physical protection inspections, and daily inspections and patrols by nuclear operation inspectors stationed on the site.

(Measures for Mid-term Risk Reduction)

The NRA developed the "Measures for Mid-term Risk Reduction at TEPCO's Fukushima Daiichi Nuclear Power Station" in February 2015 and has regularly revised it according to the progress of decommissioning.

In the Measures for Mid-term Risk Reduction at TEPCO's Fukushima Daiichi Nuclear Power Station (March 2022 Edition) revised on March 9, 2022, studies on the method of appropriate storage of materials generated by dismantling, etc. of buildings and enhancement of analysis capability for radioactive materials was raised as one of the main goals, while it was decided to set intermediate targets for newly identified issues and existing issues for which efforts had been delayed in the past.

(Analysis of TEPCO's Fukushima Daiichi NPS Accidents)

The accident analysis is one of the important tasks of the NRA which carries out investigation and analysis from technical viewpoint. Thanks to on-site environmental improvements and progress in decommissioning, accessibility to the inside of reactor buildings has been improved, and it is now possible to investigate the status of facilities and collect samples, thereby accelerating investigations and analyses including on-site surveys.

In FY2021, more detailed investigations and analyses were conducted based on "the Interim Summary of Investigation and Analysis of TEPCO's Fukushima Daiichi NPS Accident" compiled in March 2021, including drilling surveys of the shield plug at Unit 2 and surveys inside the standby gas treatment system pipes at Units 1 and 2. The views

of the operator concerning the interim summary were also confirmed. Furthermore, the NRA held the "Fukushima Daiichi NPS Decommissioning and Accident Investigation Liaison and Coordination Meeting" in which implementing bodies of accident analysis and decommissioning participated with the aim of coordinating their respective work.

The NRA also actively participated in international conferences held by the U.S. Nuclear Regulatory Commission (NRC) and other overseas organizations, transmitted information on studies relating to accident analysis, presented the overview of investigations and analyses in the OECD/NEA/CSNI research project (ARC-F) to share its knowledge with others.

(Monitoring after TEPCO's Fukushima Daiichi NPS Accidents)

According to "the Comprehensive Radiation Monitoring Plan", the NRA continued post-accident radiation monitoring of TEPCO's Fukushima Daiichi NPS, including general environmental monitoring throughout Fukushima Prefecture and monitoring of the waters near TEPCO's Fukushima Daiichi NPS and of Tokyo Bay. "The Comprehensive Radiation Monitoring Plan" was revised in March 2022 to strengthen and expand sea area monitoring by pertinent organizations in relation to the discharge of ALPS-treated water into the sea from FY2022. The Secretariat of the NRA will also strengthen and expand its assignment by increasing tritium measuring points and collecting sample water from bottom layer in addition to the surface layer at some of measuring points.

Section 1 Oversight of Efforts to Decommission Reactors

1. Approval of the Implementation Plan pertaining to TEPCO's Fukushima Daiichi NPS and Inspection

For implementing appropriate management methods in accordance with the state of the facility, the NRA designated the TEPCO's Fukushima Daiichi NPS as the "Specified Nuclear Facility" in November 2012, and instructed TEPCO to take measures for the operational safety of nuclear power reactor facilities and protection of specified nuclear fuel material. Thereafter, TEPCO formulated the "Implementation Plan Pertaining to Specified Nuclear Facility of the Fukushima Daiichi NPS" (hereinafter referred to as the "Implementation Plan") and filed an application for approval, which was granted in August 2013 with some points of concern added.

In FY2021, the NRA granted a total of eight approvals for applications to change the Implementation Plan including the installation of a facility to reduce metal and concrete waste volumes and checked compliance for the operation. Specifically, there were 8 pre-service inspections and 13 welding inspections in addition to operational safety inspections by regional safety inspectors stationed on site. The NRA also oversaw TEPCO's activities through periodic facility inspections focusing on important equipment for maintaining the performance of the facility, and conducted physical protection inspections for those which are related to physical protection of specified nuclear fuel materials.

The NRA rearranged an approach to the seismic design for the facilities at the Fukushima Daiichi NPS based on evaluation of the earthquake off the coast of Fukushima Prefecture on February 13, 2021, and requested TEPCO to re-assess the seismic classes of facilities (see 5. (1) for details).

At the 54th FY2021 NRA Commission Meeting (December 22, 2021), the NRA agreed to a policy for the review to the application for approval to change the Implementation Plan for facility installation in relation to the discharge of ALPS-treated water into the sea. It is under review at a public meeting (see 6. (1) for details).

In terms of countermeasures for COVID-19 at TEPCO's Fukushima Daiichi NPS, the NRA received an explanation at the Oversight and Review Meeting for the Specified Nuclear Facility (hereinafter referred to as the "Oversight and Review Meeting") that efforts being made include consistent enforcement of measurement of temperature and wearing masks, refraining from travel across the border of Fukushima Prefecture, and separating traffic lines of on-duty staff and other workers, and verified through operation safety inspections regarding implementation of those measures. A few cases of COVID-19 were confirmed in April to September in 2021, and January to March in 2022, but did not result in large-scale spread of contagion, and no major delay in decommissioning work was confirmed.

2. Oversight of Efforts to Address Liquid Radioactive Material

(1) Oversight of Efforts to Reduce by Half and Treat Stagnant Water in Reactor Buildings

TEPCO plans to reduce stagnant water in reactor buildings of Units 1 to 3 to about half (approximately below 3,000 m^3) of the amount at the end of FY2020 by the end of FY2024. A method to remove alpha nuclides from stagnant water must be decided to reduce water levels in reactor buildings, but as the presence of most of alpha nuclides in stagnant water was confirmed in the form of particles by analysis, it was determined to

add extra filters to the existing cesium adsorption apparatuses to remove alpha nuclides.

TEPCO's explanation to the NRA regarding filter specifications was that use of a filter about 0.02 micrometer in diameter was planned in consideration of the approximate particle size of alpha nuclides of several micrometer. The NRA will continue to check the effectiveness of the filter for removal of alpha nuclides from stagnant water.

(2) Oversight of Efforts to Treat Untreated Water in Tanks

Concentrated liquid waste, from vapor concentration devices used for treating contaminated water immediately after the Fukushima Daiichi NPS accident, was stored in areas D and H2. Due to the high salt content of the liquid waste and subsequent difficulties in using existing water treatment devices, TEPCO is studying approaches to treating liquid waste.

Due to the necessity of early treatment to avoid the risk of leak, the NRA requested that TEPCO study and report specific ways of treating concentrated liquid waste stored in areas D and H2. The NRA will continue to check the status of this investigation.

3. Oversight of Efforts to Address Spent Fuel

(1) Oversight of Efforts to Remove Fuel from Unit 1

At the 78th Oversight and Review Meeting (February 17, 2020), TEPCO proposed a procedure for removal of spent fuel from Unit 1 spent fuel pool by installing a large covers to enclose the entire Unit 1 reactor building, removing collapsed roofs and other large debris (such as overhead cranes left on operating floors of the reactor building) scattering on the operating floor and installing fuel handling equipment and ancillary devices to remove fuel.

In FY2021, the NRA received applications from TEPCO dated June 24, 2021 and August 23, 2021 for permission to change implementation plans for installing large covers and ancillary devices. The NRA requested TEPCO to re-assess earthquake protection in these applications according to "the concept of ground motion and its application in seismic design at TEPCO's Fukushima Daiichi NPS based on the earthquake off the coast of Fukushima Prefecture on February 13, 2021" (hereinafter referred as the "concept of 1F seismic design") agreed at the 30th FY2021 NRA Commission Meeting (September 8, 2021). At the same time, it promoted confirmation of the status of surveys on the strength of outer walls of the reactor building after installation of large covers. Review of the applications has been continued.

(2) Oversight of Efforts to Remove Fuel from Unit 2

At the 76th Oversight and Review Meeting (November 18, 2019), TEPCO suggested a method for removing fuel from the spent fuel pool of Unit 2 through an opening with a gantry built on the south side outer wall of the reactor building as the dose was still high in the Unit 2 reactor building. The NRA received an application dated December 25, 2020 for approval to change the Implementation Plan related to this work.

In FY2021, the NRA requested TEPCO to examine details of the application according to the concept of 1F seismic design while continuing the review of the application.

Regarding decontamination and shield installation for dose reduction of operating floors at Unit 2 reactor building, the NRA confirmed the completion of decontamination of accessible area in December 2021 before moving the existing fuel handling equipment. From February 2022, shield installation on the reactor well, where the dose is the highest in operating floor at Unit 2, started and soil improvement is underway at the south side of Unit 2 reactor building for installing a gantry to remove fuel. The progress of these tasks will be continuously monitored.

4. Oversight of Efforts to Address Solid Radioactive Material

(1) Oversight of Efforts to Install ALPS Slurry Stabilization Treatment Equipment

Muddy deposition (slurry) generated from the APLS pre-treatment equipment is stored in polyethylene high integrity containers (HICs), but because of concerns about the deterioration of HICs due to beta-ray and overflow of supernatant due to hydrogen accumulation, a slurry stabilization treatment system was examined for storing slurry in more stable form by dehydrating slurry to make it solid as early as possible, and the NRA received an application for approval to change the Implementation Plan dated January 7, 2021.

In FY2021, the NRA pointed out insufficiency of the confinement function and dust shatterproof measures of the slurry stabilization treatment equipment and requested TEPCO to modify the system design based on the insufficiency and the concept of 1F seismic design. The NRA continued to review the application. At the 91st Oversight and Review Meeting (June 7, 2021), the NRA requested TEPCO to transfer slurry from HICs that exceeded or were likely to exceed the cumulative absorbed dose of 5,000 kGy among HICs that had been used so far after taking measures such as prevention of radioactive materials' leak, and in case of a leak, prevention of contamination dispersion and monitoring of radioactive concentration in the air of inside and outside of the work area. A further request was made to TEPCO to confirm the effectiveness of safety measures for this work through a trial transfer of slurry in a relatively low-dose HIC, and according to the results, start transferring slurry in relatively high-dose HICs. The NRA confirmed that trial transfer of slurry from the first low-dose HIC was carried out on September 28, 2021, and from the second low-dose HIC on December 10, 2021, almost the entire volume of slurry was transferred though there remained some slurry at the bottom of HICs from which slurry was transferred, none of radioactive material leaked outside during work, and external dose exposure of workers was sufficiently low. Based on the results of transfer from two low-dose HICs, slurry in the first high-dose HIC was transferred on February 22, 2021 after taking safety measures such as installing improved shields when removing the lid from the high-dose HIC. The NRA will continue to monitor the adequacy of safety measures in transferring slurry from high-dose HICs upon receiving reports from TEPCO on the radiation exposure evaluation of workers and the status of slurry transfer.

(2) Oversight of Efforts to Investigate Inside Unit 1 Containment Vessel

To monitor inside the reactor containment vessel aiming at ascertaining the distribution of fuel debris and status of existing structures as part of preparations for removal of fuel debris still in the reactor containment vessel, an application for approval

to change the Implementation Plan dated July 25, 2018 was submitted by TEPCO, for which the NRA granted approval on March 1, 2019. Subsequently, the NRA has overseen the efforts to bore the X-2 penetration, and build access routes for investigation equipment.

The NRA confirmed that all work securing an access route for the monitoring equipment was completed with the removal of interfering objects from the reactor containment vessel on September 17, 2021, and the installation of a guide pipe on October 14, 2021. The subsequent work to reinstall area protections and install the monitoring equipment started from November 5, 2021, and investigations inside the Unit 1 reactor containment vessel was scheduled to commence from January12, 2022, but postponed due to equipment failure. Thereafter, equipment failure was resolved and investigation started on February 8, 2021. Full-scale confirmation of the status of existing structures and deposits at the underground level of reactor containment vessel is planned to be promoted. The NRA will continue to monitor the status of the fuel debris retrieval investigation.

(3) Oversight of Efforts to Start Full-scale Operation of Analysis Facility and Establish Analysis System

The properties of rubble and secondary waste produced by water treatment from the decommissioning work at the Fukushima Daiichi NPS must be clarified to determine treatment and disposal methods and their safety. TEPCO constructed Analysis and Research Facility Laboratory-1 (hereinafter referred to as “Laboratory-1”) on the premises of the power station to study the properties of these wastes. Operations were scheduled to begin in 2021, but delayed due to the insufficient air flow of the air conditioning system, which made design modifications necessary.

It is also necessary to study the properties of fuel debris for technical developments necessary for processes from retrieval to storage. TEPCO plans to operate Analysis and Research Facility Laboratory-2 (hereinafter referred to as “Laboratory-2”) for analyzing and testing the properties of fuel debris. The NRA received an application for approval to change the Implementation Plan dated May 20, 2020.

Since the volume of waste is expected to increase as decommissioning progresses, which makes early establishment of an analysis system essential, the NRA requested TEPCO to modify the design of the air conditioning system as soon as possible for operating Laboratory-1. The NRA requested TEPCO to re-assess earthquake resistance of Laboratory-2 based on the concept of 1F seismic design. Review of the application will be continued.

In addition to analysis and measurement of liquids sampled on a daily basis, analysis with higher performance to confirm the properties of high-dose waste and ALPS treated water, etc. are increasingly important, and as the numbers and types of samples required for analysis are expected to increase in future, the NRA has requested TEPCO to reinforce its analytical system including human resource development for future analysis. The NRA continues to monitor TEPCO's efforts to reinforce its analytical system.

(4) Oversight of Efforts to Install a Large Waste Storage for Adsorption Column with Cesium Adsorbent

Used adsorption columns from the cesium adsorption equipment are stored outdoors

at present. However, from the perspective of reducing radiation doses at site boundaries, preventing spread of contamination to the environment and storing columns in stable and long-term manners, a large waste storage for used adsorption columns is under construction. The NRA granted approval to change the Implementation Plan for installing a storage building on May 27, 2020 and subsequently received an application, dated July 22, 2020, for approval to change the Implementation Plan for installing a crane to move used adsorption columns and pedestal.

In FY2021, the NRA requested TEPCO to examine details of this application based on the concept of 1F seismic design and continues to review the application.

5. Oversight of Efforts to Address External Events

(1) Oversight of Efforts to Improve Earthquake Resistance

TEPCO evaluated the earthquake off the coast of Fukushima Prefecture on February 13, 2021 and concluded that the seismic ground motion for elastic design (maximum acceleration of 300 gal) was exceeded at TEPCO's Fukushima Daiichi NPS. Based on this result, the NRA decided to rearrange the concept of ground motion and its application in seismic design of TEPCO's Fukushima Daiichi NPS, and agreed on the concept of 1F seismic design at the 30th FY2021 NRA Commission Meeting (September 8, 2021). It was determined to set ground motion and necessary countermeasures according to facility characteristics by dividing facilities into four classes, S, B+, B and C, according to assessed exposure caused by the loss of safety function due to an earthquake, expected service duration (long-term or short-term) and degree of impact on risk reducing activities as well as considering factors such as impact on decommissioning activities, ripple effects to upper classes and service period. In applying this concept, the NRA requested TEPCO to re-assess the seismic class of the facilities, not only those applied for after September 8, 2021, but also those already applied for as of September 8, 2021, based on this concept.

(2) Oversight of Efforts to Close Openings of Building

The NRA has monitored the progress of work to close reactor building openings from perspective of preventing outflow and increasing levels of stagnant water in reactor buildings due to the recurrence of tsunamis such as those caused by the Tohoku-Pacific Ocean Earthquake in 2011 (hereinafter referred to as the “3.11 Tsunami”) in addition to the installation of seawalls against Outer-Rise Tsunami and Chishima Trench Tsunami.

The NRA confirmed that all of 127 openings of reactor buildings had been closed in January 2022 and confirmed the commencement of seawall construction from June 2021 to counter the Japan Trench tsunami as a countermeasure for the Japan Trench and Chishima Trench tsunamis announced by the Cabinet Office in April 2020.

TEPCO re-assessed the tsunami height in the event of recurrence of the 3.11 tsunami based on the current status of the Fukushima Daiichi NPS and found that it exceeded the actual height of the 3.11 tsunami by 1.5 meters resulting in overflow where reactor building openings could not be completely closed, but that the risk of stagnant water leak would be low. The NRA is reviewing the validity of this evaluation.

6. Oversight of Efforts to Address Important Points for Moving Forward with Decommissioning Work

(1) Oversight of Efforts to Discharge ALPS-Treated Water into the Sea

Following the decision of the "Basic Policy of Handling of ALPS-treated water at TEPCO's Fukushima Daiichi NPS" (hereinafter referred to as the "Government Policy") at the 5th Ministerial Meeting on Decommissioning, Contaminated Water, and Treated Water (April 13, 2021), the NRA agreed on the "Response to the Government Policy for Handling ALPS-treated Water at Fukushima Daiichi NPS" at the 3rd FY2021 NRA Commission Meeting (April 14, 2021). Regarding the review of application for approval to change the Implementation Plan for installing facilities for discharging ALPS-treated water into the sea, the NRA also agreed on the review at public meetings, examination of compliance with the regulatory requirements under the Reactor Regulation Act and review in light of Government Policy, and efforts to raise objectivity and transparency in the review of the Implementation Plan for discharge of ALPS-treated water through the review by the IAEA.

TEPCO filed an application for approval to change organizational structure related to the discharge of ALPS-treated water dated July 19, 2021, and an application for approval of installing medium to low concentration tanks (G4 North Area, G5 Area) dated August 2, 2021. These were reviewed separately at the 1st Review Meeting on the Implementation Plan for Handling ALPS Treated Water (hereinafter referred to as the "ALPS-treated Water Review Meeting," July 30, 2021) and the 2nd ALPS-treated Water Review Meeting (August 17, 2021), and approved on August 27, and November 5, 2021, respectively. The NRA held the ALPS-treated Water Review Meeting 13 times by the end of March 2021 for the application for approval to change the Implementation Plan for installing an ALPS-treated water discharge facility submitted on December 21, 2021.

(2) Oversight of Efforts to Optimize Waste Management

The radioactive waste generated from decommissioning of the Fukushima Daiichi NPS is to be stored in the temporary storage area specified in the implementation plan, but according to TEPCO's internal regulations, the temporary storage area must be used in principle, while a temporary collection site may be also used. Currently, storage at a temporary collection site has become the routine, and its scale is expanding. Storage at a temporary collection site is tentative, and waste must be moved properly to the temporary storage area, but is not now, and the progress of TEPCO's efforts to improve storage conditions is slow. There are even wastes whose managers are unknown.

Considering this situation, the NRA requested TEPCO to move waste currently stored at the temporary collection site to the temporary storage area immediately for proper management, and consider changes in the Implementation Plan if necessary.

7. Revision of the Measures for Mid-term Risk Reduction

The NRA developed a document titled “Measures for Mid-term Risk Reduction for decommissioning TEPCO’s Fukushima Daiichi NPS” in February 2015 for the purpose of setting targets for decommissioning of Fukushima Daiichi NPS, and revised it in accordance with the progress of the decommissioning work. At present, steady progress is seen in some sections, but efforts to handle solid radioactive materials fall behind the goal. As rubble generated by demolishing buildings and the volume of radioactive material to be analyzed will increase with the progress of decommissioning, immediate action must be taken. Accordingly, studies on methods to properly store rubble generated by demolishing buildings and the enhancement of analytical capabilities for radioactive materials were deemed as main goals in the “Measures for Mid-term Risk Reduction at TEPCO’s Fukushima Daiichi NPS (March 2022 Edition)”, revised on March 9, 2022, and partial modifications such as setting mid-term targets for newly identified issues and existing issues for which actions had been delayed were set (see Figures 4-1 to 4-6).

Measures for Mid-term Risk Reduction at TEPCO’s Fukushima Daiichi NPS (as of March 2022)

March 9, 2022
Nuclear Regulation Authority Japan

Areas for Risk Reduction	Major Measures over the next 10 years
Liquid Radioactive Material	【Goals】Treatment of all liquid radioactive materials including those remaining in tanks ・Progress the treatment of stagnant water containing alpha nuclides in buildings and maintain the buildings as drainage completed area except for reactor buildings. ・Decrease rainwater and groundwater flowing into buildings to prevent stagnant water in buildings from increasing and complete the treatment of all stagnant water. ・Decrease water in suppression chamber of Unit 1 and 3 to the level at which the water will not leak out of the buildings
Spent Fuel	【Goals】Storage of all spent fuels in dry storage casks ・Complete removal of all fuels from spent pools at each unit ・Expand dry storage cask area and secure storage capacity including capacity of common pools for storing all spent fuels ・Transfer fuels stored in common pool into dry storage casks as early as possible
Solid Radioactive Material	【Goals】Stabilization of high dose waste through dehydration, etc. ・Remove high-dose zeolite sandbags in main process building as well as sludge from decontamination facility, while preventing spread and leakage ・Dehydrate slurry in High Integrity Containers (HICs) 【Goals】Classification of waste according to radioactivity concentration and characteristics for proper storage and management ・Classify materials generated from decommissioning including building deconstructions according to radioactivity concentrations and characteristics for proper storage and management ・ Store and manage spent Cs adsorption columns inside buildings ・Proceed with volume reduction and incineration of solid waste such as rubble to reduce total amount of solid waste and dissolve temporary outside storage 【Goals】Installation of analytical facilities and strengthening of analytical capabilities for steadfast advancement of decommissioning ・ Install a comprehensive analytical facility for analysis of a wide variety and large amount of radioactive material and an analytical facility necessary for identifying the characteristics of debris ・Evaluate necessary capacity of radioactive material analysis and secure personnel and capability to ensure the implementation of necessary analysis 【Goals】Stable storage of fuel debris ・Take safety measures in removing fuel debris and store them in stable state
Countermeasures for External Events	・Seal outer wall of buildings and restrain inflow of groundwater into buildings significantly ・Repair damaged parts such as building roof to prevent rainwater inflow ・Take measures against deterioration and damage of building structures, etc.
Important Areas to Progress Decommissioning	・Reinforce organizational structure to progress risk reduction swiftly, and strengthen quality management ・ Reduce radiation doses by removing or shielding high-dose radiation sources such as lower part of exhaust stack at Units 1 and 2, and take measures for suppressing dust scattering during operation inside reactor buildings ・Discharge ALPS-treated water into the sea in a controlled manner ・Consider the impact of the contamination beneath the shield plugs to each decommissioning work

Figure 4-1 Measures for Mid-term Risk Reduction at TEPCO’s Fukushima Daiichi Nuclear Power Station (March 2022 Edition) Main Activities (Image to be Aimed for over the Next Decade)

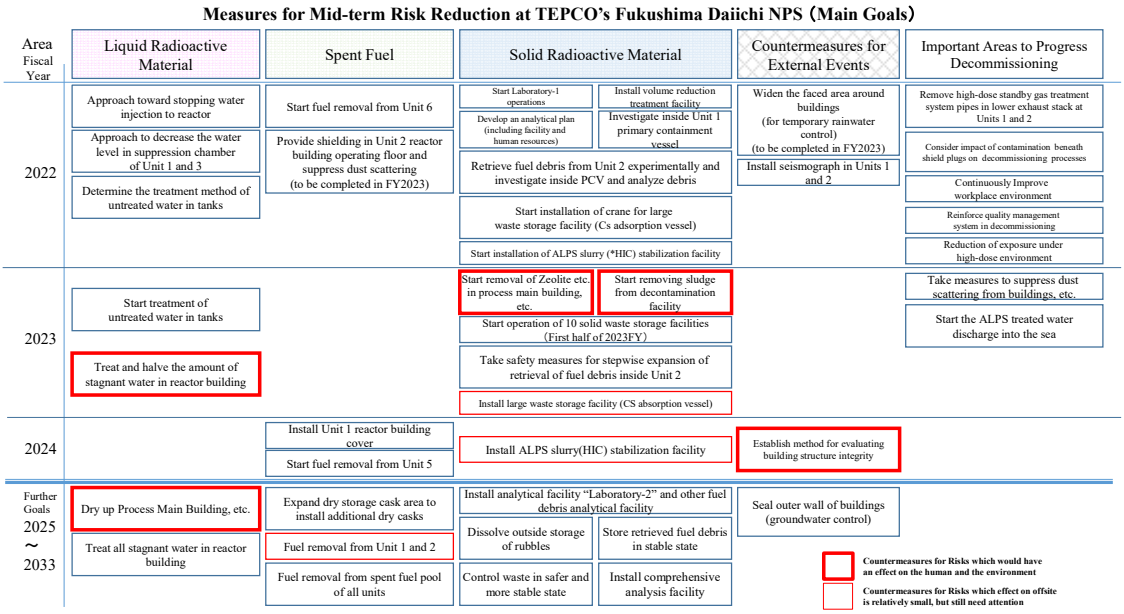


Figure 4-2 Measures for Mid-term Risk Reduction at TEPCO's Fukushima Daiichi Nuclear Power Station (March 2022 Edition) Main Goals

Measures for Mid-term Risk Reduction at TEPCO's Fukushima Daiichi NPS（Other Tasks）

Liquid Radioactive Material		Timing
To be conducted	Transfer ALPS slurry from old to new HICs	Within FY2023
	※Change 45 HICs with accumulated adsorption doses exceeding the 5,000 kGy limit by the end of January 2022	Within FY2022
Timing has not been decided	Remove underground cisterns	
	Treatment of sludge etc. remaining in dried up buildings	

Spent Fuel		Timing
To be conducted	Start to remove spent control rods	Within FY2022

Solid Radioactive Material		Timing
To be conducted	Dissolve the temporary storage areas	Within FY2022

Countermeasures for external events		Timing
To be conducted	Restrain the inflow of rainwater into radioactive waste treatment buildings of Unit 1 and 2	Within FY2022
	Expand D drainage (measures against heavy rains)	Within FY2022
	Install tide embankment against Nihon-trench Tsunami	Within FY2023

Important issues to progress decommissioning		Timing
To be continued	Survey the contamination situation inside the reactor buildings, etc. (nuclide analysis, etc.)	
	Understand the characteristics of the cooling water after cooling the reactors down (nuclide analysis, etc.)	
	Analyze the flow of contaminated water inside the reactor buildings, etc.	
	Directly observe inside the containment vessel and pressure vessel ※Observations inside the pressure vessel to be conducted afterwards	
	Reduce concentration of radioactive materials in the water of drainages	
To be conducted	Investigate other systems and units based on hydrogen accumulation in residual heat removal system (A) of Unit 3	Within FY2022
	Investigate contamination on the bottom and around Unit 1and 2 common stack	Within FY2023
Necessity to be considered	Consider methods to improve the environment of ground level 2.5m, such as removal and decontamination of soil, purification of ground water, etc.	

Figure 4-3 Measures for Mid-term Risk Reduction at TEPCO's Fukushima Daiichi Nuclear Power Station (March 2022 Edition) Other Items

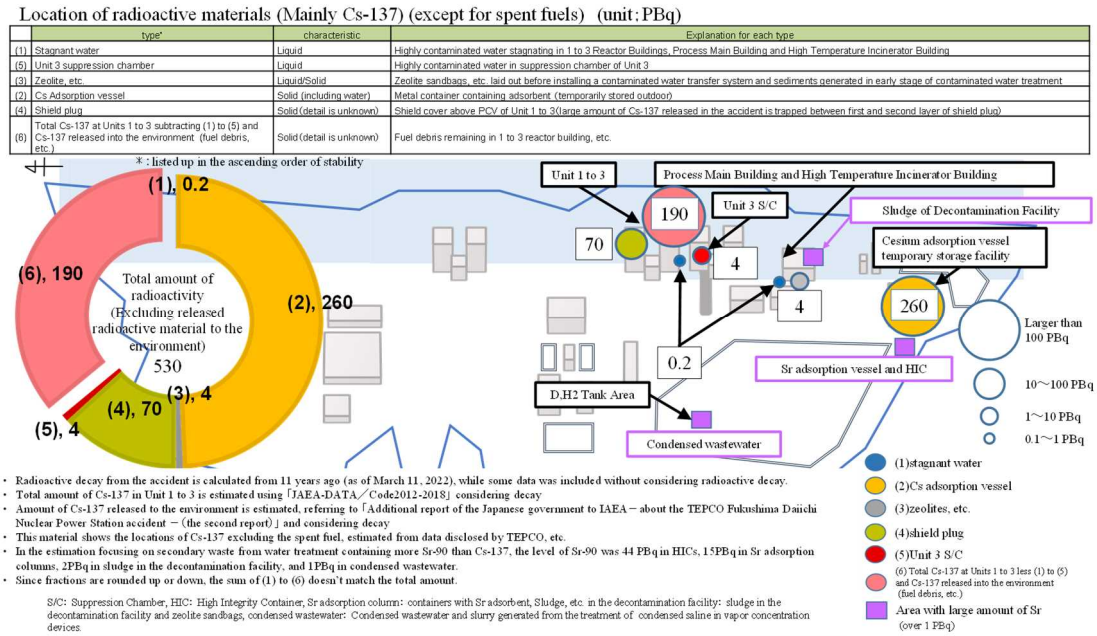


Figure 4-4 Measures for Mid-term Risk Reduction at TEPCO's Fukushima Daiichi Nuclear Power Station (March 2022 Edition) Location of Radioactive Materials (Mainly Cs-137) (Excluding Spent Fuel)

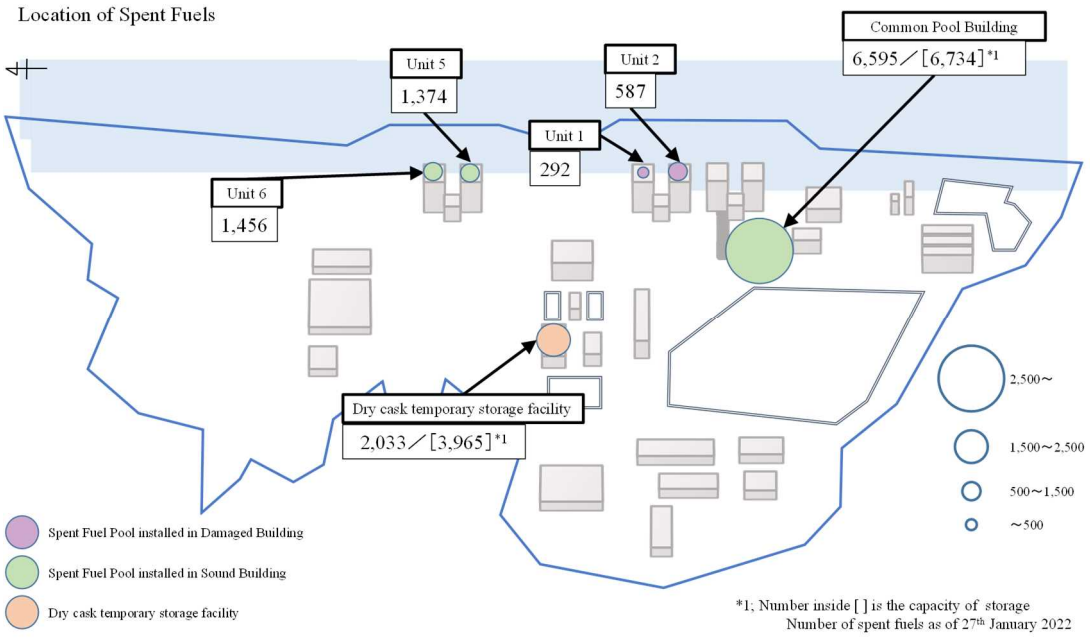


Figure 4-5 Measures for Mid-term Risk Reduction at TEPCO's Fukushima Daiichi Nuclear Power Station (March 2022 Edition) Location of Spent Fuel

List of Major Inventory (Cs-137)

Existing in Buildings or adsorption vessels

Location	Inventory (PBq)
Stagnant water (1)	0.2
Unit 3 S/C (5)	4
Zeolite (3)	4
Cs adsorption vessel (2)	260
Shield plug (4)	70
Total Cs-137 at Units 1 to 3 subtracting(1) to (5) and Cs-137 released into the environment (fuel debris, etc.)	190
Total amount of Cs-137 released into the environment (atmosphere and ocean) in a few weeks after the accident	14
Total amount of Cs-137 at Units 1 to 3	540

Spent Fuel

Location	Inventory (PBq)
Unit 1 Spent Fuel Pool	130
Unit 2 Spent Fuel Pool	350
Unit 3 Spent Fuel Pool	0
Unit 4 Spent Fuel Pool	0
Unit 5 Spent Fuel Pool	740
Unit 6 Spent Fuel Pool	780
Spent Fuel Common Pool	3,500
Dry Storage Cask	1,100
Total amount	6,600

- Inventory inside the red frame should be taken measures in high priority
- Each value above has a large error, because they are evaluated indirectly such as from the balance of the amount of Cs-137 in stagnant water, extrapolation from single data, estimation from the average amount of Cs-137 inside 1 spent fuel assembly, etc.
- Only the amount of radioactive material in S/C at Unit 3 was shown, because it is the only available data at present.
- Since fraction is rounded up or down, sum of each inventory doesn't match the total amount.

Figure 4-6 Measures for Mid-term Risk Reduction at TEPCO's Fukushima Daiichi Nuclear Power Station (March 2022 Edition) List of Major Inventory (Cs-137)

8. Identification of Causes of Event and Confirmation of Corrective Actions at TEPCO's Fukushima Daiichi NPS

(1) Incidents under Obligation to Report at TEPCO's Fukushima Daiichi NPS

Regarding the incident under obligation to report on March 25, 2021 related to the leak of materials contaminated by nuclear fuel, etc. within the controlled area in temporary storage area W2, the NRA received a report on the cause of incident and corrective actions taken from TEPCO, but, due to insufficient recurrence prevention measures for this incident, requested corrections on October 11, 2021. TEPCO submitted a correction on February 22, 2022, but a partial deficiency was found in the content, and TEPCO filed a second correction on March 18, 2022 after making necessary adjustments. The NRA continues to check the causes and recurrence prevention measures described in the report.

In FY2021, there was one new incident under obligation to report at TEPCO's Fukushima Daiichi NPS. It is described below.

(a) Leak of Materials Contaminated with Nuclear Fuel, etc.to Outside of Controlled Area

It was confirmed on July 5, 2021 that analyses of water regularly sampled once a month in the drainage basin in temporary storage area P at the premises of Fukushima Daiichi NPS indicated 750Bq/L of the total beta radioactivity concentration, which is higher than the previous value.

In the investigation of the condition around the drainage basin, TEPCO found that the hatch lids on the top plate and the top plates themselves were displaced in two notch tanks that store contaminated soil in the area, and there were traces of overflow from the opening of the tanks. It was therefore assumed that rainwater entered the notch tanks, causing radioactive materials in the stored contaminated soil to dissolve into accumulated rainwater, and due to the subsequent intermittent rainfall, the notch tanks completely filled with rainwater containing radioactive materials (e.g. Sr-90) overflowed from the notch tank to the ground surface in this area and partially flew in the drainage basin. The NRA received a report for an incident under obligation to report on July 19, 2021, indicating further possibility of water flowing into the sand basin from the drainage basin through a drain ditch and flowing out of the controlled area. On February 22, 2022, the NRA received another report on the cause of incident and corrective actions taken from TEPCO, but because of inadequacies in the content, TEPCO made adjustments and filed a corrected report on March 18, 2022. The NRA continues to check the cause and recurrence prevention measures in this report.

Section 2 Accident Analysis

1. Continuous Accident Analysis

Accident analysis is one of the important tasks of the NRA which carries out investigations and analyses from technological viewpoint.

Improvements in on-site environment and progress of decommissioning work have increased accessibility to the inside of reactor buildings, and it is now possible to investigate the status of facilities and collect samples. Accordingly, implementation policies and systems for additional investigation and analysis were decided at the 28th FY2019 NRA Commission Meeting (September 11, 2019). Thereafter, investigations and analyses have been carried out at the Committee on Accident Analysis of Fukushima

Daiichi Nuclear Power Station (hereinafter referred to as the "Accident Analysis Review Committee"), established in the NRA, using the results of on-site investigations and records of the accident at TEPCO's Fukushima Daiichi NPS.

In FY2021, a total of 19 on-site investigations were carried out and the Accident Analysis Review Committee was held 9 times to review survey results, including drilling survey on the shield plug at Unit 2 and investigations of inside of standby gas treatment system pipes at Units 1 and 2 based on the information obtained from on-site surveys. At the 7th FY2021 NRA Commission Meeting (May 12, 2021), the NRA received a report regarding the operator's views on the Interim Summary of Investigation and Analysis of TEPCO's Fukushima Daiichi NPS Accident, compiled on March 5, 2021, at the 60th FY2021 NRA Commission Meeting (January 19, 2022), received a report on the results of confirmation of operator's views partially based on the additional questions and exchange of opinions with the operator at the Accident Analysis Review Committee.

Furthermore, the NRA held the "Fukushima Daiichi NPS Decommissioning and Accident Investigation Liaison and Coordination Meeting" twice in FY2021, with the participation of the Agency of Natural Resources and Energy, Nuclear Damage Compensation and Decommissioning Facilitation Corporation, TEPCO, and the Secretariat of the NRA, and made necessary coordination.

2. Efforts to Transmit Information about Analysis of TEPCO's Fukushima Daiichi NPS Accident

The NRA transmits information on the accident analysis at home and abroad.

On-site investigations recorded and released on Internet video sites in FY2021 include the investigation of the standby gas treatment system filter train in Unit 2 reactor building (June 25, 2021), preliminary investigations (August 26, 2021) and main investigations (September 9, 2021) of radiation dose measurements on operating floor using a remote controlled robot in Unit 2 reactor building, investigations inside Unit 3 reactor building (November 25, 2021), and investigations inside Unit 1 reactor building (November 26, 2021). These videos were also used in discussions at the Accident Analysis Review Committee.

In addition to workshops at the Atomic Energy Society of Japan, the NRA proactively participated in international meetings such as those held by the U.S. Nuclear Regulatory Commission (NRC), the IAEA-INSAG[31] forum, and other meetings held by overseas organizations, and transmitted information on studies of accident analyses. In the OECD/NEA/CSNI research project (ARC-F), the NRA presented the results of investigations inside reactor buildings and dose-rate distributions of containment vent pipes to share the knowledge with other participants (from 12 countries).

Section 3 Implementation of Radiation Monitoring

1. Implementation of Radiation Monitoring of Land and Sea Areas in Response to TEPCO's Fukushima Daiichi NPS Accident

The NRA engaged in post-accident radiation monitoring of TEPCO's Fukushima Daiichi NPS according to the Comprehensive Radiation Monitoring Plan (established

[31] International Nuclear Safety Group/IAEA

at the Monitoring Coordination Meeting on August 2, 2011 and revised on March 30, 2022) including general environmental monitoring throughout Fukushima Prefecture and monitoring of the waters around TEPCO's Fukushima Daiichi NPS and of Tokyo Bay, and released the analysis results every quarter of the fiscal year on the NRA website. The NRA is also monitoring details of difficult-to-return zones and released the results on the NRA website.

(1) Long-term Perspective on the Distribution of Radioactive Materials in Fukushima and Neighboring Prefectures

The NRA conducted air-borne monitoring in Fukushima and neighboring prefectures and published air dose rate distribution maps[32] of monitored areas in March 2022. It also released the results of measurement in air dose rate distribution including vehicle-borne surveys in Fukushima and neighboring prefectures including air dose rate distributions and the measurement of radioactive cesium deposition in soil on the NRA website in January 2022.

(2) Measuring Air Dose Rates in Fukushima and Neighboring Prefectures by Monitoring Posts

At the request of local governments, the air dose rates are measured continuously with about 700 units of Portable Monitoring Posts and about 3,000 units of Real-time Dose Measuring Systems installed at public locations, such as schools in Fukushima and its neighboring prefectures. The results are announced on the NRA website in real time.

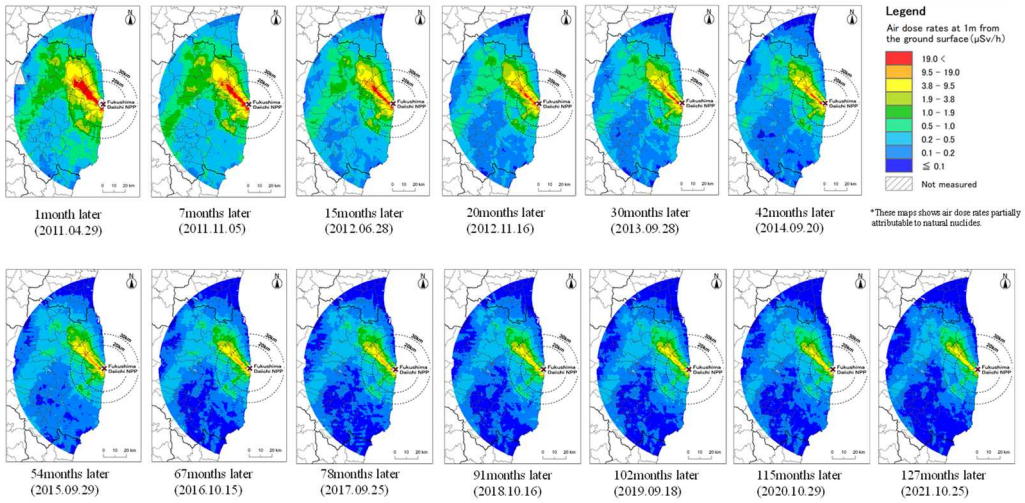


Figure 4-7 Changes in Air Dose Rate Distribution Map within 80 km Zone

[32] Air dose rate distribution maps as of October 25, 2021 in 80 km zone from TEPCO's Fukushima Daiichi NPS and in Fukushima and neighboring prefectures

(3) Sea Area Monitoring

Sea area monitoring was also implemented in FY2021 according to the Comprehensive Radiation Monitoring Plan in cooperation with pertinent organizations. The NRA collected seawater and sediment from near, coast, offshore, and open ocean of TEPCO's Fukushima Daiichi NPS and from Tokyo Bay, analyzed the radioactivity in those samples, and announced the results on the NRA website.

Based on the Government Policy decided on April 13, 2021, the government and TEPCO will strengthen and enhance monitoring before and after the discharge of ALPS-treated water and ensure reliability of analytical capabilities through inter-comparison of monitoring results among analytical institutions in cooperation with the IAEA. Consequently, the NRA held the Monitoring Coordination Meeting (April 27, 2021, March 30, 2022), and the Marine Environment Monitoring and Measurement Task Force meetings (1st meeting on June 18, 2021, 2nd meeting on September 21, 2021, and 3rd meeting March 14, 2022) to promote discussions and preparations. In March 2022, the Comprehensive Radiation Monitoring Plan was revised to assign pertinent organizations to sea area monitoring strengthened and enhanced from FY2022 for checking the fluctuation of tritium concentrations in the respective sea areas before and after the discharge of ALPS-treated water. The NRA is planned to strengthen and enhance its monitoring capability by increasing tritium measuring points (from 12 to 20 locations) and collecting seawater at bottom layer in some locations in addition to the surface sampling.

The NRA has collected samples in the vicinity of TEPCO's Fukushima Daiichi NPS jointly with the IAEA and exchanged analytical results with the IAEA for inter-comparison every year since FY2014. As part of these efforts, experts in analytical institutions in France, Germany and South Korea came to Japan in November 2021 to confirm the sampling and other operational statuses in addition to the IAEA.

Chapter 5 Appropriate Implementation of Radiation Protection Measures and Emergency Preparedness and Response

○ **Summary of Chapter 5**

(Promotion of Radiation Protection Measures)

The Radiation Council compiled reports in response to two consultations from relevant ministries. The council followed up on the response to the recommended views on reviews of the dose limit for the lens of the eye and revised the "Summary of the basic concepts of radiation protection." It also considered the approach to radiation protection against natural radionuclides, such as those contained in rocks.

The NRA has been steadily carrying out the "Radiation Safety Research Promotion Program" initiated in FY2017. Some results of this Project were reported to the Radiation Council meeting and contributed to investigate and review on international radiation protection trends.

The NRA reviewed the structure required to conduct radiation safety research in the Regulatory Standard and Research Department from FY2022 onward.

(Rigorous and Proper Implementation of the Radioisotope Regulation Act and Continuous Improvement)

The NRA addressed procedures such as review of applications for permission and approval and inspection of operators who submitted notifications for permission strictly and properly regarding the use, sale, lease, waste management and other handling of radioisotopes, use of radiation generators, disposal and other handling of radioactively contaminated objects based on the Radioisotope Regulation Act.

The NRA carried out hearing opinions of operators once about the development of review guidelines based on the Radioisotope Regulation Act, and revised the "Guideline for Matters to Be Set Forth in the Radiation Hazards Prevention Rules" which was one of those review guidelines.

(Continuous Improvement of the NRA Guide for Emergency Preparedness and Response)

The NRA decided on a partial revision of the "NRA Guide for Emergency Preparedness and Response" (NRA EPR Guide) and approved the revision of "Distribution and Administration of Stable Iodine" at the 21st FY2021 NRA Commission Meeting (July 21, 2021) so as to further clarify the applicable persons who must evacuate in the site area emergency phase.

The NRA also discussed basic matters concerning the monitoring of thyroid exposure dose in emergencies at the Study Team on Thyroid Dose Monitoring in Emergencies, which was established in February 2021 and summarized the discussion in the report. At the 1st FY2022 NRA Commission Meeting (April 6, 2022), the NRA also decided on revisions of the NRA EPR Guide and approved the "Role of and Designation Requirements to Nuclear Emergency Core Hospitals and Other Institutions" to reflect the report.

(Development and Operation of the Crisis Management System)

To reinforce the emergency response capabilities of the NRA, a review was conducted on the initial response system for the information collection situation and for alert-level event and the Nuclear Emergency Response Manual was revised on January 27, 2022, in light of lessons learned from responses to the earthquake centered offshore of Fukushima

Prefecture in February 2021 and the alert-level event at the Kindai University Atomic Energy Research Institute on July 2021.

To maintain and improve emergency response capabilities systematically and continuously from normal times for ensuring proper emergency responses in the event of a nuclear accident or emergency, the NRA formulated the Basic Policy for Emergency Response Training on April 26, 2021 and the Operational Details of Basic Policy for Emergency Response Training in August 23, 2021. Based on this, the NRA built a system in which a training participation plan can be developed by individual function teams, etc. based on the common training program, and implementation of training according to the plan made by each personnel can be evaluated from the last half of FY2021 onward.

In addition, the NRA also made efforts to implement and evaluate training, extract and improve problems identified through training and reinforce communication network equipment and system. To strengthen nuclear operators' emergency response capability, the NRA assessed emergency drills carried out by operators at their commercial nuclear power reactors and nuclear fuel facilities, and implemented measures to improve the operators' decision-making and on-site response capabilities through the Training Scenario Development Working Group.

The NRA organized and examined various types of training courses relating to nuclear emergency medicine, prepared for online training sessions, if available, in FY2022 onward, and for continuous maintenance of the nuclear emergency medical system, added personnel expenses in the FY2021 budget to secure and nurture next-generation personnel in the nuclear emergency medicine field with the focus on the Core Advanced Radiation Emergency Medical Support Center, and assigned them as highly professional personnel.

(Implementation of Radiation Monitoring)

The NRA publishes monitoring information on a routine basis using the "Radiation Monitoring Information Sharing and Publication System (RAMIS)" aimed at aggregating results of emergency monitoring in the event of a nuclear emergency, sharing them among the parties concerned, and disclosing relevant information promptly. It also continuously measures environmental radiation dose nationwide and publishes results on its website.

While promoting technical studies relating to radiation monitoring and newly formulating the Environmental Radioactivity Measuring Methods Series No. 35 "Environmental Sample Collection Methods in Emergency" in June 2021, the NRA revised the "Ordinary Radiation Monitoring" (supplementary reference material for the NRA EPR Guide) and the "Emergency Radiation Monitoring" (supplementary reference material for the NRA EPR Guide) in December 2021.

Section 1: Promotion of Radiological Protection Measures

1. Investigation and Review by Radiation Council

Established under the NRA, the Radiation Council is intended to uniform technical standards for preventing radiation hazards on the basis of the Act on Technical Standards for Prevention of Radiation Hazards (Act No. 162 of 1958).

The Radiation Council held three general meetings. In those meetings, the council followed up the operation of the Amended Regulation on Prevention of Ionizing Radiation Hazards, identified as matters to be taken into consideration in the reports on reviews of the equivalent dose limit for the lens of the eye. It also revised the "Summery of the basic concepts of radiation protection" through deliberation relating to adding explanations on the clearance, reflecting the ICRP recommendations concerning radiation protection in case of a large nuclear accident, and organizing the radiation source related and personal related in dose criteria.

The council received reports by external experts on the latest domestic situation to consider the approach to radiation protection against natural radionuclides such as those contained in rocks. The Secretariat of the NRA reported the status of follow-up using measurements of surrounding environment by relevant organizations and results of surveys on actual state of management for the handling of titanium residue, coal ash and in-house radon, which were stipulated as future topics to discuss in the reported from the Subcommittee on Fundamentals of the Radiation Council titled "The Exemptions of Naturally Occurring Radioactive Material from Regulatory Control."

At the 155th Radiation Council General Meeting (February 18, 2022), the following consultations, incorporation of the IEC Standards into domestic laws and regulations relating to technical standards for preventing radiation hazards, submitted from relevant ministries, were reviewed and confirmed as valid:

- Revision of the medical x-ray equipment standards and Enforcement Regulations on the Medical Care Act
- Revision of the Enforcement Regulations on the Veterinary Practice Act

2. Promotion of Safety Research on Radiation Protection

The NRA has been carrying out the "Radiation Safety Research Promotion Program" (hereinafter called "the Program" in this paragraph) since FY2017, aiming to systematically and effectively promote investigations and research for ensuring safety through regulation of radiation sources and radiation protection measures.

The Program is composed of "Regulatory Radiation Safety Research Projects" and "Radiation Protection Research Networking Projects," For the "Regulatory Radiation Safety Research Projects" in FY2021, research projects were invited for two priority areas designated by the NRA, "Feasibility research for responding to mid- to long-term issues relating to radiation protection" and "Feasibility research on radiation monitoring/analysis technologies for nuclear disasters," whereupon four new research projects were adopted, while existing three projects were continued. For the "Radiation Protection Research Networking Projects," two existing projects were continued.

The Research Promotion Committee including external experts deliberated the selection of themes and progress management. The results of FY2021 research were

evaluated by the external experts at the Research Evaluation Committee in February 2022.

Regarding the program, some results of the problem-solving network and umbrella-type integrated platform formation project in the radiation protection research field were reported at the 153rd Radiation Council General Meeting (June 23, 2021) and contributed to investigation and review of international radiation protection trends.

Regarding six safety research projects completed at the end of FY2020, the results of ex-post facto evaluation and the future approaches based on these results, discussed at the 1st FY2021 Research Evaluation Committee Meeting (June 24, 2021), were reported at the 30th FY2021 NRA Commission Meeting (September 8, 2021).

Regarding the implementation structure for radiation safety research starting from FY2022, approval was granted at the 67th FY2020 NRA Commission Meeting (March 24, 2021) for conducting research in the Regulatory Standard and Research Department, advancing the preparation for that through collaboration between the Regulatory Standard and Research Department and the Radiation Protection Department in FY2021 and deciding the details of safety research topics for implementation from FY2022 onward through the process of the safety research enforcement policy made under the Regulatory Standard and Research Department. At the 7th FY2021 NRA Commission Meeting (May 12, 2021), the NRA received a report stating that the selection of research division responsible for radiation protection research must be considered in association of technical fields, and taking this opportunity, the possible improvements of the structure in the Regulatory Standard and Research Department must also be discussed.

Consequently, at the 20th FY2021 NRA Commission Meeting (July 14, 2021), the NRA agreed on the safety research structure in and after FY2022 including the enhancement of the risk assessment research structure and collaboration between research divisions, in addition to the consideration of research divisions responsible for radiation protection research. (Reprinted, see Sections 2 of Chapter 2)

Section 2 Implementation and Continuous Improvement of Regulations Relating to the Radioisotope Regulation Act

1. Rigorous and Proper Implementation of Radioisotope Regulation Act

To prevent radiation hazards due to the use of radioisotopes or radiation generators, and ensure public safety by protecting specific radioisotopes, the NRA regulates the use, sale, lease, waste management and other handling of radioisotopes, use of radiation generators and other handling of radioactively contaminated objects, based on the Radioisotope Regulation Act.

Flexible operations of notifications and inspections, etc. based on the Radioisotope Regulation Act, undertaken as countermeasures for COVID-19 pandemic since FY2020, were basically completed at the 36th FY2021 NRA Commission Meeting (October 6, 2021) as the state of emergency had been lifted. (Reprinted, see Sections 4 of Chapter 1)

The implementation status of regulations is shown below.

(1) Application/Notification

In FY2021, there were 7718 applications and notifications based on the Radioisotope Regulation Act.

The number of licenses granted for radiation protection supervisors in FY2021 were 463 for first-class, 180 for second-class and 216 for third-class.

(2) Inspections

While taking prevention measures of the transmission and spread of COVID-19, the NRA carried out 22 inspections for radiation hazard protection and 126 inspections for security of specified radioisotope protection in FY2021.

(3) Confirmation of the Causes and Recurrence Prevention Measures against Accidents and Failures Occurred in Operator's Sites

Operators must report to the NRA about the occurrence of an incident falling under Article 31-2 of the Radioisotope Regulation Act (hereinafter referred to as an "incidents under obligation to report").

In FY2021, two such incidents were reported. There were none likely to cause radiation hazards to any employees or the general public.

The NRA conducts INES evaluation on events at operators' sites. Regarding three incidents under obligation to report in FY2020, two were evaluated as level 0 (with no safety significance) and one was excluded from evaluation at the 11th FY2021 NRA Commission Meeting (June 2, 2021).

The incidents under obligation to report in FY2021 are outlined below.

(a) Radioisotope Leak in a Controlled Area at Oji F-Tex

On June 1, 2021, Oji F-Tex reported an incident that some radioisotopes of a sealed source (krypton-85) contained in a basis weight sensor had leaked in a controlled area and spread outside the area at Fuji Factory of Tokai Mill.

On December 16, 2021, Oji F-Tex reported the causes and remedies for the incident. This report concluded that no impact of the incident on human bodies and the environment as a result of measurement of the dose in the surroundings of the controlled area, assessments of the indoor radiation dose outside the controlled area and worker exposure dose. It also said the leak would be caused by a mistake in the process of combining radiation sources with the basis weight sensors during manufacturing, or oversight in the final inspection. As a recurrence prevention measure, Oji F-Tex will confirm that the delivered basis weight sensor was manufactured with improved manufacturing processes and strengthened process control, which are the recurrence prevention measures of the manufacturing company.

(b) Radioisotope Leak in a Controlled Area at Koa Kogyo

On January 28, 2022, Koa Kogyo reported an incident under obligation to report that, some radioisotopes of a sealed source (krypton-85) contained in a basis weight sensor had leaked in a controlled area at its head factory. Koa Kogyo is investigating the causes and examining measures to prevent recurrence.

2. Continuous Improvement of Regulation pertaining to the Radioisotope Regulation Act

(1) Development of Guidelines for Review of Regulation of Radioisotopes

As the Radioisotope Regulation Act amended in 2017 has been sequentially put into force, the NRA promotes the development of review and inspection guides, which consolidate matters to be referred to for judging the conformity to regulatory requirements stipulated in the Radioisotope Regulation Act. At the 30th FY2019 NRA Commission Meeting (September 18, 2019), the NRA decided a policy that the NRA should address drafts of the guidelines sequentially after they are developed partially, and then present them to operators to hear their opinions at public meetings. The NRA carried out hearing of operators once in FY2021.

The NRA improved the "Guideline for Matters to Be Set Forth in the Radiation Hazards Prevention Rules," which is one of these guidelines, in order to describe the approach for operators to set forth the matter concerning measures to ensure the reliability of measurement in the prevention rules, as required by the revision of the "Implementing Regulations for the Prevention of Radiation Hazards due to Radioisotopes, etc. (Prime Minister's Office Ordinance No. 56 of 1960) in September 2020. The draft guideline was discussed at the 39th FY2021 NRA Commission Meeting (October 20, 2021), and the NRA carried out procedures of public comments and amended the guidelines at the 71st FY2021 NRA Commission Meeting (March 16, 2022).

Section 3 Continuous Improvement of the NRA Guide for Emergency Preparedness and Response (NRA EPR Guide)

Based on the Act on Special Measures Concerning Nuclear Emergency Preparedness (Act No. 156 of 1999; hereinafter referred to as "Nuclear Emergency Act"), the NRA has developed the NRA EPR Guide to ensure smooth implementation of nuclear emergency measures to be taken by nuclear operators, the national government and local governments, etc. The Guide is to be continuously improved based on newly acquired knowledge, status of efforts by local governments and the results of nuclear emergency drills.

The NRA decided on a partial revision of the NRA EPR Guide at the 21st FY2021 NRA Commission Meeting (July 21, 2021). This revision further clarified the persons who must evacuate in the site area emergency phase based on the actual situation of "local emergency preparedness and response plan including evacuation plan" compiled by each local nuclear disaster management council and the status of facilities for sheltering where radiation protection measures have been taken, through continuous work from FY2020. At the same meeting, the NRA also approved the revision of "Distribution and Administration of Stable Iodine" to modify the description based on the revision of NRA EPA Guide.

The NRA also began conducting studies by holding a total of four meetings of a "Study Team on Thyroid Dose Monitoring in Emergencies" (two each in FY2020 and

FY2021) with the aim of examining basic matters relating to thyroid exposure dose monitoring in emergencies, as an emergency response measure in case of a nuclear emergency if concerns over internal exposure were to arise due to inhalation of radioactive iodine. The NRA received reports on study results summarized by the study team on targets for monitoring the thyroid exposure dose, measuring methods and actual measurement situation at the 34th FY2021 NRA Commission Meeting (September 22, 2021) and approved the policy to revise the NRA EPA Guide. The NRA also discussed approaches for that review on facility requirements to nuclear emergency core hospitals and other institutions and approved the policy to revise the NRA EPA Guide at the 41st FY2021 NRA Commission Meeting (October 27, 2021).

In light of these, the NRA discussed the draft revision of the NRA EPA Guide and the draft of enactment of the "Role of and Designation Requirements to Nuclear Emergency Core Hospitals and Other Institutions," as a sweeping revision of "Facility Requirements to Nuclear Emergency Core Hospitals and Other Institutions," at the 62nd FY2021 NRA Commission Meeting (January 26, 2022), solicited views and decided the revision and agreed on the draft at the 1st FY2022 NRA Commission Meeting (April 6, 2022).

Section 4 Development and Operation of the Crisis Management System

1. Reinforcement of Emergency Response Capabilities

The NRA is tasked with the duty of ensuring safety in the utilization of nuclear energy to contribute to the protection of the lives, health and properties of the citizens, preservation of the environment and national security of Japan. To fulfill this duty, the NRA is tasked with protecting the people and environment even in the event of a nuclear disaster by utilizing its expertise and immediately responding in an organized manner.

(1) Emergency Response

On July 14, 2021, lightning caused a power failure at the Kindai University Atomic Energy Research Institute. Upon receiving a report that the nuclear power reactor was being shut down, but there was a possibility of losing the monitoring function of the reactor control room, the NRA and the Cabinet Office established an NRA and Cabinet Office Nuclear Accident Joint Alert Headquarters at 13:37 of that day, and convened an emergency meeting, including the NRA Chairman and Commissioners. Immediately after the power failure, Kindai University reported no abnormalities in equipment and no changes in the values at surrounding monitoring posts. The information was shared with the relevant ministries and agencies and transmitted via the NRA website and email. Subsequently, upon confirming that continuous monitoring could be maintained with an alternative means, the Headquarters was abolished at 14:13 of the same day.

At 23:36 on March 16, 2022, an earthquake offshore from Fukushima Prefecture occurred, and intensity 6 lower was observed in the municipalities where the nuclear facilities were located including Ishinomaki City in Miyagi Prefecture and the towns of Naraha, Tomioka, Okuma and Futaba in Fukushima Prefecture, and intensity 5 upper in Onagawa Town in Miyagi Prefecture. At 23:44 of that day, the NRA and Cabinet Office recognized this as an alert-level event, established an NRA and Cabinet Office Nuclear

Accident Joint Alert Headquarters and convened an emergency meeting, including the NRA Chairman and Commissioners. Immediately after the earthquake, the operator reported the status of facilities and radiation measurements in the surrounding areas and the Headquarters checked for the presence of any abnormality. The information was shared with the relevant ministries and agencies and transmitted via the NRA website and email. The emergency status was withdrawn and the Headquarters was closed at 4:46 on March 17.

Regarding an earthquake offshore from Miyagi Prefecture on May 1, 2021 and an earthquake with the seismic center in northwestern Chiba Prefecture on October 7, 2021, the NRA immediately confirmed no abnormality in nuclear facilities in the information collection situation, and transmitted the information.

(2) Formulation of Basic Policy for Emergency Response Training and Operational Details

Staff members of the NRA Secretariat should maintain and improve their emergency response capabilities in ordinary times in an organized, continuous manner to properly respond to nuclear accidents or emergencies based on lessons learned from accidents. The NRA formulated the Basic Policy for Emergency Response Training on April 26, 2021 and Operational Details on August 23, 2021 so that the staff members of the NRA Secretariat and those of the Director General for Nuclear Disaster Management realize the importance of emergency response and steadily work on training. Accordingly, the NRA developed a training participation plan by the functional team based on the common training program, and built a system to evaluate that each personnel completes training according to the designated plan. This system was conducted from the second half of FY2021 onward.

(3) Preparation of Crisis Management and Response Manuals

As efforts relating to crisis management, the NRA modified the Basic Disaster Management Plan, reviewed the initial response system in the information collection and alert level situations, changed the guide to issue requests to relevant local governments in light of lessons learned from responses to the earthquake off the coast of Fukushima Prefecture with maximum intensity of 6 upper on February 13, 2021 and to the alert-level event triggered by a lightning-caused power failure at Kindai University Atomic Energy Research Institute on July 14, 2021, and revised the Nuclear Emergency Response Manual on January 27, 2022. Taking the Kindai University case into consideration, the emergency action level for nuclear facilities having relatively minor risks was reviewed and the measures for determining when to withdraw the emergency status was clarified.

Ongoing from FY2020, desktop exercises were carried out to check the effectiveness of the manual developed to clarify the initial response in case of a disaster during overland transportation of radioactive materials. The manual will be revised based on the results.

The NRA also opted to revise the “NRA’s Business Continuity Plan (Countermeasures for Tokyo Inland Earthquake) at the 17th FY2021 NRA Commission Meeting (June 30,

2021) to reflect requirements in the "Business Continuity Guidelines for National Central Government Ministries: Second Edition (Measures to Deal With a Tokyo Inland Earthquake) (Director General for Disaster Management at the Cabinet Office in April 2016). Moreover, the NRA reviewed the Business Continuity Plan based on the results of responses to the earthquake with a seismic center in northwestern Chiba Prefecture on October 7, 2021 and opted to revise it at the 60th FY2021 NRA Commission Meeting (January 19, 2022).

(4) Functional Enhancement of Disaster Prevention Drills

To enhance its emergency response capability, the NRA carried out desktop exercises centering on emergency decision makers such as the NRA's Chairman and commissioners and its Secretariat's executives and participated in some emergency drills by nuclear operators. The NRA examined issues identified in exercises thus far, and conducted desktop exercises to hone the ability to decide on protective measures to be taken off-site.

The NRA conducted training in conjunction with nuclear operators' emergency drills to explore a method of smooth information sharing between the ERC plant team and nuclear operators' immediate response centers, thereby improving operators' emergency response capability. Moreover, in addition to the ERC plant team, functional teams also carried out training in connection with nuclear operators' emergency drills. The NRA also carried out emergency communication training with the local governments of regions where nuclear facilities are present, activity drills for emergency monitoring centers and drills for physical protection to improve the abilities of personnel in charge of each functional team as well as identifying and improving problems through various training sessions.

As a measure to prevent COVID-19 transmission, the number of participants in each drill was limited, but efforts were made to improve response capability by increasing the number of drills.

The NRA also checked facilities and equipment as well as their functions taking occasions of various exercises and drills such as on-foot gathering in an emergency, communications, setting-up the Emergency Response Headquarters and operation of emergency generators (actual load) to ameliorate the effectiveness of business continuity plans responding to emergency cases, such as the Tokyo Inland Earthquakes.

(5) Enhancement and Reinforcement of Medical Systems for a Nuclear Disaster

With regard to the development of medical systems for a nuclear disaster, the NRA strived for close coordination, through the Secretary-General Conference of Medical Support Centers, with the National Institutes for Quantum Science and Technology designated as the Core Advanced Radiation Emergency Medical Support Center as well as with Hirosaki University, Fukushima Medical University, Hiroshima University and Nagasaki University which have been designated as Advanced Radiation Emergency Medical Support Centers and Nuclear Emergency Medical Support Centers and established a network among nuclear emergency medical care organizations through a council for promoting regional nuclear emergency medical coordination. In addition, the

NRA supported the development of facilities and equipment for the said 5 institutes and universities and developed an environment for accepting radiation-exposed patients and providing related education and training for medical personnel. As a measure to prevent COVID-19 transmission, the NRA organized and examined details of training that could be conducted remotely, centered on the Core Advanced Radiation Emergency Medical Support Center. In and after FY2022, it would carry out mock training sessions, which had been further refined.

Moreover, personnel expenses were included in the FY2021 budgets for securing and developing next-generation personnel in the nuclear emergency medicine field, primarily at the Core Advanced Radiation Emergency Medical Support Center and highly professional personnel was assigned for continuously maintaining nuclear emergency medicine systems.

As FY2021 marked three years since the previous review of the requirements for the facility of nuclear emergency core hospitals in FY2018, a draft revision was discussed based on the issues identified in FY2020. The NRA examined approaches for the review of requirements for the facility of nuclear emergency core hospitals, etc. and agreed to promote the revision of the related documents at the 41st FY2021 NRA Commission Meeting (October 27, 2021). In light of this, the NRA discussed a draft revision of the "NRA EPR Guide" and the draft of the "Role of and Designation Requirements to Nuclear Emergency Core Hospitals and Other Institutions," which was a sweeping revision of the "Facility Requirements to Nuclear Emergency Core Hospital" at the 62nd FY2021 NRA Commission Meeting (January 26, 2022), solicited public views and decided the revision and agreed on the draft at the 1st FY2022 NRA Commission Meeting (April 6, 2022).

2. Reinforcement of Nuclear Operators' Emergency Preparedness and Response

(1) Enhancement of Evaluation of Emergency Drills by Nuclear Operators

The NRA has been holding the Debriefing Session of Emergency Drills by Nuclear Operators and evaluating drills conducted by nuclear operators since FY2013.

The debriefing session was held on August 3, 2021, in which the NRA received a report from its Secretariat regarding the results of evaluating nuclear operators' emergency drills. For the operators of commercial power reactor facilities, evaluation was separated depending on operators on evaluation indicators "information sharing with the ERC plant team" and "utilization of information sharing tool." Some operators were evaluated as steadfastly improving and others as on the way. Regarding other indicators, efforts for improvement contributed to improving their crisis response capabilities. Based on the evaluation in past five years (FY2015 to FY2020), continuous monitoring of all operators for their efforts for steadfast improvement was decided.

For the operators of fuel cycle facilities, etc., although Japan Nuclear Fuel Limited was evaluated as needing further improvement for evaluation indicators "information sharing with the ERC plant team" and "utilization of information sharing tools," both the JAEA and Japan Nuclear Fuel Limited were evaluated as working to improve their crisis response capabilities for other indicators. Continuous monitoring of their efforts

for steadfast improvement was decided.

For the operators of other nuclear fuel facilities, etc., continuous monitoring was decided on their efforts for steadfast improvement in sharing information with the ERC plant team by taking measures for resolving issues and necessities identified. Based on the evaluation results during the past 5 years (FY2016 to FY2020), the NRA decided to continuously monitor the state of improvement in future so that improvement efforts by every nuclear operator will take root. A two-part training (part 1 for training based on realistic scenarios, and part 2 for training to check the action taken by the emergency response center and headquarters) was provided for some nuclear sites with relatively low risk (the sites where there are only facilities of IAEA Hazard Class III or all nuclear facilities are specified in the Cooling Notification[33]).

Based on the training scenario reviewed by the Training Scenario Development Working Group formulated under the debriefing sessions since FY2017, nuclear operators have conducted training for improving the judging ability of the commanders of nuclear power plants' emergency response centers and central control rooms and also training for enhancing on-site response ability. In FY2021, training sessions to improve the judging ability of the commanders were carried out by five nuclear operators based on training scenarios prepared in FY2019 and six nuclear operators based on training scenarios prepared in FY2020. Training sessions to enhance on-site response ability were conducted by nine nuclear operators based on training scenarios prepared in FY2020. In light of the results, the NRA started preparing training scenarios in FY2021.

[33] A notification to designate facilities for operation of nuclear reactors where irradiated fuel assemblies have been cooled for a sufficient period of time pursuant to provisions of Tables (f) and (h) of Article 7 (i) and Tables (f) and (h) of Article 14 of the Regulations on events, etc. to be reported by the nuclear emergency preparedness manager pursuant to the Act on Special Measures Concerning Nuclear Emergency Preparedness.

Table 5-1 Record of Emergency Drills by Nuclear Operators at Commercial Power Reactors in FY2021

○Record of Emergency Drills by Nuclear Operators at Commercial Power Reactors in FY2021

№	Implementation date	Place	
1	September 10, 2021	Tokyo Electric Power Company Holdings, Inc.	Fukushima Daiichi NPS Fukushima Daini NPS
2	September 24, 2021	Kansai Electric Power Co., Inc.	Takahama NPS
3	October 1, 2021	Kyushu Electric Power Co., Inc.	Genkai NPS
4	October 8, 2021	Tohoku Electric Power Co., Inc.	Higashidori NPS
5	November 19, 2021	Kansai Electric Power Co., Inc.	Ohi NPS
6	November 26, 2021	Hokkaido Electric Power Co., Inc.	Tomari NPS
7	December 3, 2021	Japan Atomic Power Company	Tsuruga NPS
8	December 9, 2021	The Chugoku Electric Power Co., Inc.	Shimane NPS
9	January 18, 2022	Kyushu Electric Power Co., Inc.	Sendai NPS
10	January 21, 2022	Hokuriku Electric Power Co., Inc.	Shika NPS
11	January 25, 2022	Shikoku Electric Power Co., Inc.	Ikata NPS
12	February 4, 2022	Tokyo Electric Power Company Holdings, Inc.	Kashiwazaki-Kariwa NPS
13	February 18, 2022	Kansai Electric Power Co., Inc.	Mihama NPS
14	February 25, 2022	Tohoku Electric Power Co., Inc.	Onagawa NPS
15	March 1, 2022	Chubu Electric Power Co., Inc	Hamaoka NPS
16	March 4, 2022	Japan Atomic Power Company	Tokai NPS (Drill Part 1) Tokai Daini NPS
17	March 28, 2022	Japan Atomic Power Company	Tokai NPS (Drill Part 2)

○FY2021 at Commercial Power Reactors
Assessment indices for emergency drills by nuclear operators

Category	№	Index
Information Sharing/ notification	1	Flow information for information sharing
	2	information sharing with ERC plant team (1) Accident/Plant situation, (2)、Progression forecasting and accident response strategy, (3) Strategy progress
	3	Use of tools for information sharing (1) Use of plant information display system (drills using ERSS or SPDS), (2) Liaison activities,(3) Use of COP,(4) Use of documents kept by ERC
	4	Certain notification and communications, (1) Accuracy of notification text, (3) Explanation grounds for EAL judgment, (4) Response of Article10 confirmation meeting, (5) Article 25 report
Efforts to improve emergency drills by nuclear operators	5	Formulation of drill implementation plan based on issues in previous drills
	6	Scenario diversification and difficulty
	7	Implementation of on-site field training
	8	Public relations activities (1) Press response linked with ERC public relations team, (2) Participation of players from outside company such as reporters, (3) Participation of players from outside company such as persons in charge public relations at other nuclear operators, (4) Holding mock press conferences, (5) Dissemination of information to the outside using information dissemination tools
	9	Logistical support activities (1) Support activities between nuclear operators,(2) Linkage with disaster response support centers of nuclear operators, (3) Linkage with nuclear emergency support organizations
	10	Inspection of drills (1) Inspection of other nuclear operators, (2) Accepting inspections of one's own drills, (3) Acceptance of peer review, (4) Inspection of on-site field training of other nuclear operators
	11	Self-assessment and analysis of drill results (1) Identification of issues from problem points, (2) Analysis of causes, (3) Countermeasures bated on cause analysis results

* At each drill. NRA Secretariat staff participate as plant team personnel of the Prime Minister's office or Secretariat ERC/OFC. dispatched personnel from the Secretariat ERC at the operator's immediate response center, or as dispatched personnel for the emergency response station, and some personnel evaluate the situation of the operator drill.
(Personnel from the ERC plant team and other functional teams participated in the drills at the Takahama NPS on September 24 and the Tomari NPS on November 26.)

Table 5-2 Record of Emergency Drills by Nuclear Operators at Nuclear Fuel Facilities (Japan Atomic Energy Agency and Japan Nuclear Fuel) in FY2021

○ Record of Emergency Drills by Nuclear Operators at Nuclear Fuel Facilities (Japan Atomic Energy Agency and Japan Nuclear Fuel Ltd.) in FY2021

№	Implementation date	Place	
1	September 7, 2021	Japan Atomic Energy Agency	Ningyo-toge Environmental Engineering Cener
2	October 15, 2021	Japan Atomic Energy Agency	Prototype Advanced Converter Reactor Fugen
3	November 9, 2021	Japan Atomic Energy Agency	Oarai Research and Development Institute
4	November 30, 2021	Japan Nuclear Fuel Limited	Reprocessing Facility
5	December 14, 2021	Japan Atomic Energy Agency	Prototype Fast Breeder Reactor Monju
6	December 21, 2021	Japan Nuclear Fuel Limited	Enrichment and Waste Disposal Site (Enrichment Division / Waste Disposal Division)
7	February 22, 2022	Japan Atomic Energy Agency	Nuclear Fuel Cycle Engineering Labs of JAEA
8	March 8, 2022	Japan Atomic Energy Agency	Nuclear Science Research Institute

○ Evaluation Indices of Emergency Drills by Nuclear Operators at Nuclear Fuel Facilities (Japan Atomic Energy Agency and Japan Nuclear Fuel Ltd .) in FY2021

Category	№	Index
Information Sharing/ notification	1	Flow information for information sharing
	2	information sharing with ERC plant team (1) Accident/Plant situation, (2)、Progression forecasting and accident response strategy, (3) Strategy progress
	3	Use of tools for information sharing (1) Use of plant information display system (drills using ERSS or SPDS), (2) Liaison activities,(3) Use of COP,(4) Use of documents kept by ERC
	4	Certain notification and communications, (1) Accuracy of notification text, (3) Explanation grounds for EAL judgment, (4) Response of Article10 confirmation meeting, (5) Article 25 report
Efforts to improve emergency drills by nuclear operators	5	Review of mid-term plan
	6	Formulation of drill implementation plan based on issues in previous drills
	7	Implementation of drills with no scenario indicated
	8	Scenario diversification and difficulty
	9	Public relations activities (1) Press response linked with ERC public relations team, (2) Participation of players from outside company such as reporters, (3) Holding mock press conferences, (4) Dissemination of information to the outside using information dissemination tools
	10	Logistical support activities (1) Support activities between nuclear operators,(2) Linkage with disaster response support centers of nuclear operators, (3) Linkage with nuclear emergency support organizations
	11	Inspection of drills (1) Inspection of other nuclear operators, (2) Accepting inspections of one's own drills, (3) Acceptance of peer review
	12	Self-assessment and analysis of drill results (1) Identification of issues from problem points, (2) Analysis of causes, (3) Countermeasures bated on cause analysis results
Record of emergency drills by nuclear operators	13	Drill participation rate of emergency response personnel (facility)
	14	Drill participation rate of emergency response personnel (immediate response center)

Table 5-3 Record of Emergency Drills by Nuclear Operators at Nuclear Fuel Facilities (other than Japan Atomic Energy Agency and Japan Nuclear Fuel) in FY2021

○ Record of Emergency Drills by Nuclear Operators at Nuclear Fuel Facilities (other than Japan Atomic Energy Agency and Japan Nuclear Fuel Ltd.) in FY2021

№	Implementation date	Place
1	October 12, 2021	Toshiba Energy Systems & Solutions Corporation, Nuclear Engineering Laboratory
2	October 19, 2021	Nuclear Development Corporation
3	October 26, 2021	Nuclear Material Control Center, Rokkasho Safeguards Center
4	November 2, 2021	Institute for Integrated Radiation and Nuclear Science, Kyoto University
5	November 16, 2021	Kindai University
6	December 7, 2021	Nuclear Material Control Center, Tokai Safeguard Center
7	January 11, 2022	Nuclear Fuel Industries Ltd, Tokai Works
8	January 14, 2022	Nuclear Professional School, School of Engineering, the University of Tokyo
9	January 28, 2022	Nuclear Fuel Industries, Ltd, Kumatori Works
10	February 1, 2022	Mitsubishi Nuclear Fuel Co., Ltd.
11	February 8, 2022	Nippon Nuclear Fuel Development Co., Ltd
12	February 15, 2022	Global Nuclear Fuel-Japan Co., Ltd.

○ Evaluation Indices of Emergency Drills by Nuclear Operators at Nuclear Fuel Facilities (Japan Atomic Energy Agency and Japan Nuclear Fuel Ltd.) in FY2021

Category	№	Index
Information Sharing/ notification	1	Information sharing with emergency response station and ERC plant team
	2	Certain notification and communications (1) Notification by FAX within 15 minutes, (2) Accuracy of notification test, (3) Explanation of grounds for EAL judgement, (4) Article 25 report
	3	Operation of communications equipment (operation of communications equipment for connecting with emergency response station and ERC plant team)
Efforts to improve emergency drills by nuclear operators	4	Review of mid-term plan
	5	Formulation of drill implementation plan based on issues in previous drills
	6	Implementation of drills with no scenario indicated
	7	Scenario diversification and difficulty
	8	Public relations activities (1) Press response linked with ERC public relations team, (2) Participation of players from outside company such as reporters (including PR staff of other nuclear operators), (3) Holding mock press conferences, (4) Dissemination of information to the outside using information dissemination tools
	9	Logistical support activities (1) Support activities between nuclear operators,(2) Linkage with disaster response support centers of nuclear operators
	10	Inspection of drills (1) Inspection of other nuclear operators, (2) Accepting inspections of one's own drills, (3) Acceptance of peer review, and (4) Inspection of drills at ERC
	11	Self-assessment and analysis of drill results (1) Identification of issues from problem points, (2) Analysis of causes, (3) Countermeasures bated on cause analysis results
Record of emergency drills by nuclear operators	12	Drill participation rate of emergency response personnel (facility)

(2) Collaboration with Relevant Ministries and Agencies Pertaining to Nuclear Emergency Preparedness

Based on the provisions of the Basic Disaster Management Plan and to coordinate emergency responses and necessary support at nuclear sites, the NRA has been holding meetings of the Central Liaison Council for Nuclear Disasters, which consists of relevant ministries and agencies, nuclear operators and the Atomic Energy Association (ATENA). In FY2021, the NRA held 2 meetings of the Central Liaison Council for Nuclear Disasters, regarding the implementation status of training in cooperation with related organizations and efforts by nuclear operators. In regions where nuclear power plants are located, the NRA holds meetings of the Local Liaison Councils for Nuclear Disasters, which consist of local branch bureaus and departments of the member ministries and agencies of the Central Liaison Council located in a given area, the prefectural police headquarters responsible for the area (prefectural police headquarters of an area which becomes a wide-area evacuation site for the given area, as necessary), the fire department, the Regional Coast Guard Headquarters (Coast Guard Office responsible for the given area, as necessary), the Self Defense Forces and nuclear operators. In FY2021, the NRA held such meetings in eight areas, six of which in correspondence, to strengthen collaboration among related organizations.

3. Reinforcement of Communication Network Equipment and Systems

Regarding the integrated nuclear emergency preparedness network system, proper

maintenance was carried out, such as periodic inspections and checking the function of equipment, with the aim of ensuring ongoing use in a stable manner. The NRA also established emergency measures at the bases of fixed satellite communication systems, which is one of efforts in the "Three-Year Emergency Response Plan for Disaster Prevention, Disaster Mitigation and Building National Resilience (December 14, 2018)." The implementation had been postponed due to the effects of the COVID-19 pandemic.

Regarding the Emergency Response Support System (ERSS), for which a system update was carried out in FY2019, the NRA planned and implemented system repairs in accordance with the equipment renewal plan of the nuclear operator and appropriately performed system maintenance so that information on nuclear reactor facilities can always be provided.

In March 2021, the NRA started operating the "Radiation Monitoring Information Sharing and Publication System (RAMIS)" aimed at aggregating, sharing and swiftly disclosing emergency monitoring results in the event of a nuclear emergency and discloses monitoring information also at ordinary times to facilitate information transmission to the public in an emergency.

Section 5 Implementation of Radiation Monitoring

1. Enhancement of Emergency Monitoring Systems in Areas where Nuclear Facilities are Located

The NRA EPR Guide stipulates that the level of emergency will be determined in accordance with the situation of the affected nuclear facility to implement preventive protective measures. Emergency measures at an early stage or measures after the release of radioactive materials, for instance, evacuation or temporary relocation, will be decided and conducted appropriately based on the actual measurement values of the emergency monitoring. Based on this guideline, the NRA developed an effective emergency monitoring system including the constant on-site stationing of senior specialists for radiation monitoring to command the monitoring of the vicinity of nuclear facilities during an emergency. The NRA also further improved and reinforced the measurement system through steps such as providing technical support to local governments engaged in installation and maintenance of measuring equipment such as monitoring posts.

2. Operation of Radiation Monitoring Information Sharing and Publication System (RAMIS)

In March 2021, the NRA started operating the "Radiation Monitoring Information Sharing and Publication System (RAMIS)" aiming to aggregate, share and swiftly disclose emergency monitoring results in the event of a nuclear emergency and discloses the monitoring information also at ordinary times to facilitate information transmission to the public in an emergency.

3. Reinforcement of Emergency Response Capabilities through Training Activities

In FY2021, the training for practical monitoring was conducted 24 times and the training involving the Emergency Monitoring Center was conducted 13 times for local government officers to improve the effectiveness of local governments in emergency monitoring. Efforts were also made to strengthen the emergency response capability of the staff having assembled in an emergency by adding e-learning lectures to enable them to use the RAMIS properly to collect information.

4. Radiation Monitoring of Nationwide Environment

(1) Environmental Radioactivity Level Research (Conducted since FY1957)

In the 47 prefectures throughout Japan, the NRA collected environmental samples, such as atmospheric suspended dust, fallout and soil for radioactivity analysis. The results of measurement were put into a database in sequence and published on the NRA website. Furthermore, dose rate is continuously measured at 296 monitoring posts throughout Japan to open the measured data on the NRA website in real time.

(2) Oceanic Environmental Radioactivity Comprehensive Evaluation (Conducted since FY1983)

To investigate radiation effects in the surrounding areas of nuclear power plants and nuclear fuel reprocessing plants as well as nationwide environmental radioactivity levels, the NRA continued the radiation analysis of sea water in 16 ocean areas. The measurement results for FY2020 will be put into a database and published on the NRA website.

(3) Radiation Monitoring in the Vicinity of Nuclear Power Plants (Subsidies Issued since FY1974)

Financial support by the NRA was provided for the development of facilities necessary for radiation monitoring and radioactivity measurement implemented by prefectures where nuclear facilities are located or neighboring prefectures (24 prefectures). In addition, the measured results reported by those local governments were put into database sequentially to be published on the NRA website.

(4) Monitoring of the Impact of Nuclear Events Overseas (Monitoring started in FY2018)

With regard to the impact of radioactive substances on Japan when nuclear power related events occur abroad, the NRA installed monitoring posts in Tsushima and on Yonaguni Island so that the state of dose rate can be grasped more precisely. Also in FY2021 the NRA website announced the measurement results.

(5) Training for the Monitoring Personnel of Local Governments (Implemented since FY1990)

The NRA carried out “training for environmental radiation analysis” 18 times, targeting environmental radiation monitoring personnel in each prefecture.

5. Radiation Survey concerning Ports of Call of Nuclear-Powered Warships and Reinforcement of Emergency Monitoring Systems

(1) Radiation Survey concerning Ports of Call of Nuclear-Powered Warships

The NRA periodically conducted radiological surveys in cooperation with related organizations such as the Japan Coast Guard at the 3 ports of Yokosuka, Sasebo and Kinnakagusuku, where the United States nuclear-powered warships make port calls, regardless of the presence or absence of such ships. Especially, during each nuclear-powered warship port call, the NRA organized a radiological survey team that measured radioactivity and analyzed sea water samples and it was confirmed that the measurement results were of the same level as those before port calls. The NRA daily published the radiological survey results during both port entries and exits of nuclear-powered warships on its website and compiled past results into a database and made them publicly available.

(2) Reinforcement of Emergency Monitoring Systems

To cope with the aging of monitoring stations, renovation was completed at a station at Sasebo Port, Nagasaki Prefecture and a station at Yokosuka Port, Kanagawa Prefecture.

6. Investigation on Technical Matters Relating to Monitoring

The NRA holds the meeting of the "Technical Study Team on Environmental Radiation Monitoring" which is engaged in continuous studies on technical aspect of monitoring. In June 2021, the NRA newly formulated the Series of Environmental Radioactivity Measuring Methods No. 35 "Environmental Sample Collection Methods in Emergency" based on studies at the meeting up to FY2020. This manual describes basic matters, procedures of environmental sample collection in emergencies, sampling record forms, an example check list of materials and tools that will be needed, prevention of contamination of materials and tools and protection of monitoring personnel, among others. In December 2021 and March 2022, the NRA held the technical study team meeting to review a draft of new tome of the Series of Environmental Radioactivity Measuring Methods "Measurement of Radioactive Substances in the Atmosphere" and a concept for revision of the Series of Environmental Radioactivity Measuring Methods No. 15 "Radioiodine Analysis in Emergencies."

Draft revisions to the "Ordinary Radiation Monitoring" and "Emergency Radiation Monitoring" (both are supplementary reference materials for the NRA EPA Guide)" were reported for review of additional descriptions of monitoring outside nuclear facility sites, including nuclear power reactor facilities with decommissioning plan and well-cooled nuclear fuel[34] at the 52nd FY2021 NRA Commission Meeting (December 15, 2021) and revisions were accepted on December 21, 2021.

[34] Power reactor facility designated by the NRA on the assumption that the decommissioning plan has been approved based on the provisions of Article 43-3-34, paragraph (2) of the Reactor Regulation Act, and that the irradiated fuel assemblies have been cooled for a sufficient period of time.

References

TABLE OF CONTENTS

Reference 1 Materials related to ensuring independence, impartiality and transparency, and improving the organizational structure/system (related to Chapter 1)

1. Members of NRA

	September 19, 2012 to September 18, 2014	September 19, 2014 to September 18, 2015	September 19, 2015 to September 21, 2017	September 22, 2017 to
Chairman	Tanaka Shunichi	Tanaka Shunichi	Tanaka Shunichi	Fuketa Toyoshi
Commissioner (Substitute for the Chairman)	Shimazaki Kunihiko	Fuketa Toyoshi	Fuketa Toyoshi	Tanaka Satoru
Commissioner (Second substitute for the Chairman)	Fuketa Toyoshi	Tanaka Satoru	Tanaka Satoru	Yamanaka Shinsuke
Commissioner (Third substitute for the Chairman)	Nakamura Kayoko	Nakamura Kayoko	Ishiwatari Akira	Ban Nobuhiko
Commissioner (Fourth substitute for the Chairman)	Oshima Kenzo	Ishiwatari Akira	Ban Nobuhiko	Ishiwatari Akira

(As of March 31, 2022)

2. Establishment of the NRA and Organizational Changes

- ○ September 19, 2012: NRA was established
- ○ March 1, 2014: Japan Nuclear Energy Safety Organization (JNES) was abolished and integrated.
- ○ October 14, 2014: Policy Director for Nuclear Emergency Preparedness was established in the Cabinet Office. Officials belonging to the NRA were primarily appointed as concurrent officials of the Office for the Nuclear Emergency Preparedness, Cabinet Office. To reinforce the nuclear emergency response system, changing the appointment scheme, full-time officials were assigned to the Cabinet Office.

3. Breakdown of Budget of NRA (after revision in FY2021)

	Budget section	Budget for FY2021 (after budget revision) (million yen)
General account	General and Administrative costs	4,294
	NRA facility costs	1,512
	Costs of ensuring nuclear safety	4,544
	Radioactivity investigation and research costs	1,446
Special account for energy measures	Costs of power-usage measures	702
	Costs of nuclear safety regulatory measures	19,419
	Administrative handling costs	24,905
	Disbursements	0.27
	Reserve funds	100
Special account for reconstruction after the Great East Japan Earthquake	Costs of policies for environmental conservation and restoration	3,459
Total		60,381

4. Organization of the NRA

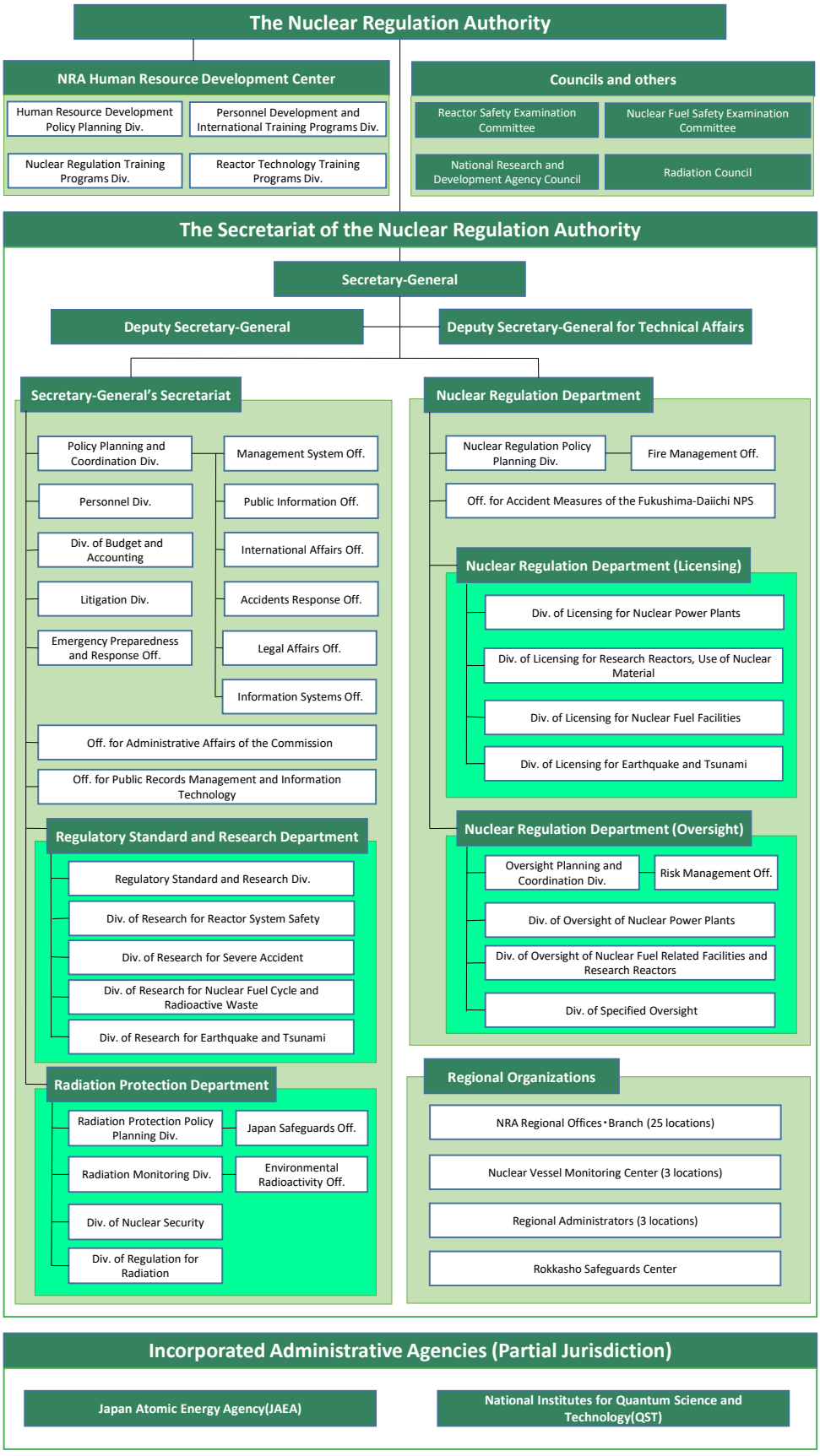


Figure i Organizational Structure of the NRA (April 2021 - March 2022)

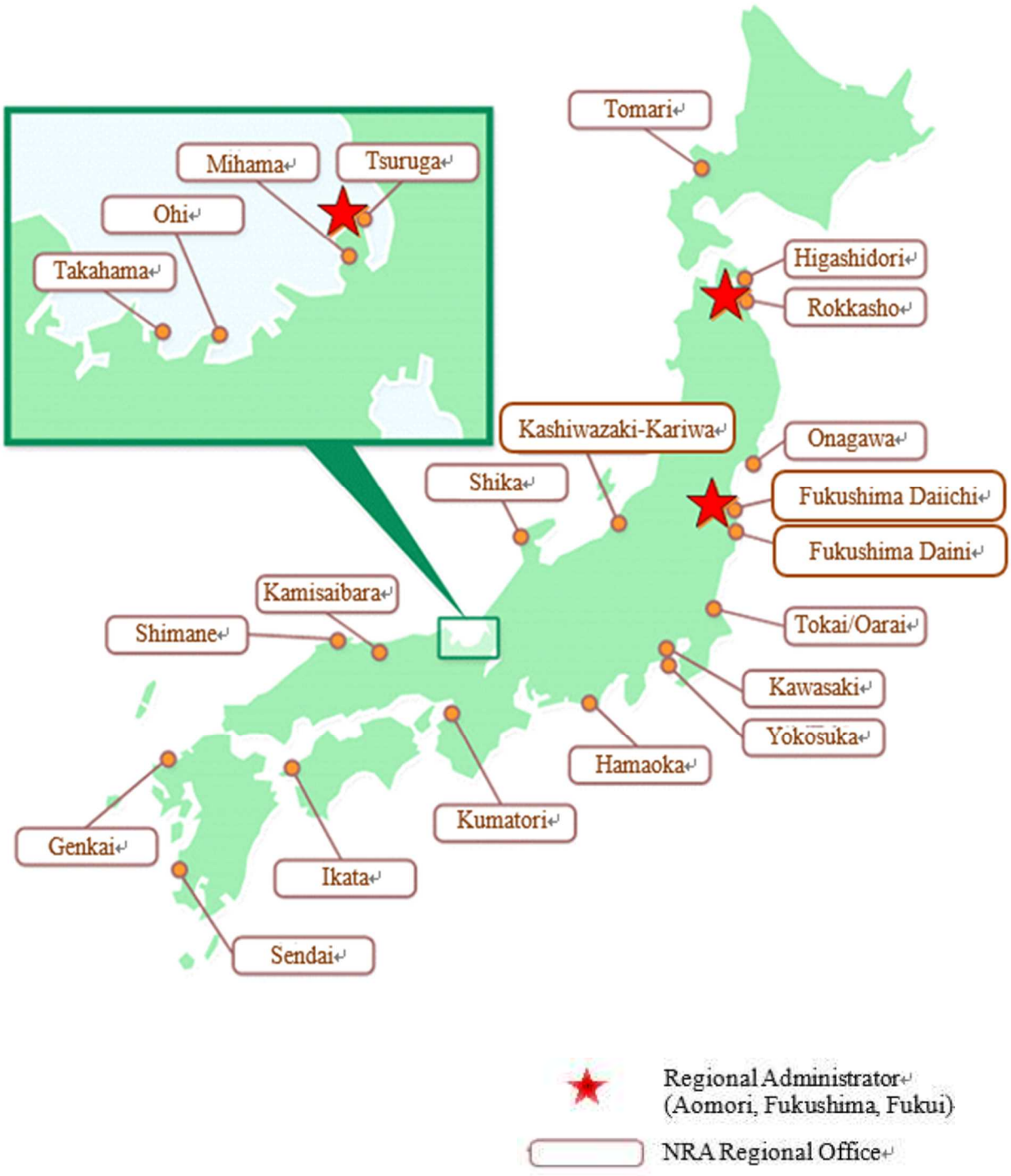


Figure ii Location of NRA Regional Offices and Stationing of Regional Administrators

5. NRA's Core Values and Principles

(Determined on January 9, 2013 by the NRA)

Bearing in mind that:

-The NRA was established to learn from the Fukushima Daiichi nuclear accident of March 11, 2011;

-Nuclear accidents should never be allowed to happen again;

-Restoring public trust, in Japan and abroad, in the nation's nuclear regulatory organization is of utmost importance and;

-The nuclear safety system and management must be rebuilt on a solid basis, placing the highest priority on public safety and a genuine safety culture;

Determined that:

-Everyone involved in nuclear activities must have a high degree of responsibility and ethical values and seek to achieve the highest levels of global safety;

We hereby solemnly pledge our full commitment and unwavering efforts to the foregoing.

Mission

Our fundamental mission is to protect the public and the environment through rigorous and reliable regulation of nuclear activities.

Guiding Principles for Activities

We in the NRA and its supporting Secretariat shall perform our duties diligently acting in accordance with the following principles.

(1) Independent Decision Making

We shall make decisions independently, based on the latest scientific and technological information, free from any outside pressure or bias.

(2) Effective Actions

We shall discard the previous ineffective approach to regulatory work and stress the importance of a field-oriented approach to achieve genuinely effective regulations.

(3) Open and Transparent Organization

We shall ensure transparency and appropriate information disclosure on regulations, including the decision-making process. We shall be open to all opinions and advice from Japan and the international community and avoid both self-isolation and self-righteousness.

(4) Improvement and Commitment

We shall be diligent in learning and absorbing the latest regulatory know-how and best practices, enhancing individual capacity, and performing our duties, mindful of the highest ethical standards, a sense of mission, and rightful pride.

(5) Emergency Response

We shall be ready to swiftly respond to all emergencies, while ensuring that in 'normal' times a fully effective response system is always in place.

6. Code of Conduct on Nuclear Security Culture

(Determined on January 14, 2015 by the NRA)

The Nuclear Regulation Authority (NRA) recognizes that it is the responsibility of everyone involved in nuclear activities to establish and maintain a positive nuclear security culture.

The NRA has therefore decided to establish a code of conduct to foster and continually enhance its own nuclear security culture.

On this basis, the NRA is committed to take action to enhance nuclear security culture throughout Japan.

Code of Conduct

1. Recognizing Threat

The NRA and its Secretariat shall recognize that nuclear security threats exist at all times and constantly keep the importance of nuclear security in mind.

2. Interface with Safety

Nuclear security and safety do not exist independently and measures for security and safety are mutually dependent on each other and could negatively affect one another. We shall make all possible efforts for the harmonization of both measures and senior management shall be responsible for providing the most appropriate solution in cases of conflicts.

3. Responsibilities of Senior Management

Senior management shall demonstrate their commitment to nuclear security and shall make an assessment on how a positive nuclear security culture is developed within the NRA. In addition, senior management shall continuously work to foster the positive culture through setting up concrete goals and measuring achievements.

4. Capacity Building and Self-improvement

Nurturing competent staff is the responsibility of an organization, and the NRA shall provide capacity building programs on nuclear security. We shall have a ‘questioning attitude’ towards nuclear security issues at all times and strive to improve our effectiveness.

5. Confidentiality and Communication

While strictly observing confidentiality of nuclear security information, we shall proactively communicate with relevant stakeholders, as necessary, with a view to fostering a positive nuclear security culture in Japan.

7. Statement on Nuclear Safety Culture

(Determined on May 27, 2015 by the NRA)

Safety shall be given the overriding priority in the utilization of nuclear energy. Safety culture is recognized as continued practices with mindful awareness of this principle. It is the duty of everyone involved in nuclear energy to foster safety culture.

Recognizing its importance, the Nuclear Regulation Authority (NRA) has developed the code of conduct on safety culture taking due account of the lessons learned from the accident at the Fukushima Daiichi Nuclear Power Station of Tokyo Electric Power Company, Inc. The NRA will take the initiative in acting based on it.

Thereby, the NRA will strive to raise awareness of the importance of safety culture among everyone involved in nuclear energy and hence contributing to fostering safety culture in Japan.

Code of Conduct

1. Priority on safety

In full recognition that absolute safety is not achievable and the possibility of a serious accident remains, the overriding priority shall be placed on safety for "protecting people and the environment".

2. Decision-making taking into account the risks

Decisions shall be made in an independent and objective manner taking due account of the risks. Anyone who makes a decision is responsible for logically explaining the rationale of the decision while clarifying its own roles, responsibilities, and authority.

3. Fostering, sustaining and strengthening safety culture

Managers shall take the initiative in fostering the attitudes and actions that place the overriding priority on safety in their respective organizations. For sustaining and further strengthening safety culture, they shall also be vigilant to any early warning signs of decline in safety culture and shape and enhance the working environment so that the staff can maintain high morale.

4. Maintaining high level of expertise and organizational learning

Recognizing the importance of scientific and technical expertise for safety, each organization shall collect and analyze the latest information in Japan and overseas on regulatory activities, operating experience, and others to utilize the findings in its activities. Managers shall shape and enhance the working environment to promote such organizational learning.

5. Effective communication

Open and frank discussion in the workplace shall be the basis in the pursuit of safety. Managers shall create such a working environment and promote active discussion in their respective organizations. Adequate communication shall be pursued both within the organization and with stakeholders for enhancing transparency and building trust by taking the initiative in information disclosure and exchange of a wide range of opinions.

6. Questioning attitude

All the personnel shall always have one's own "questioning attitude" without complacency concerning any weaknesses that may affect safety, as well as whether there is any room for further improvement, and thereby identify safety issues.

7. Rigorous and prudent decisions and agile actions

In response to any challenges to ensuring safety, all the staff shall make conservative decisions for safety taking into account even the worst-case scenario, and quickly take necessary actions.

8. Harmonization with nuclear security

It is necessary to recognize that nuclear safety and security activities do not exist independently, they complement each other and interfere with each other. All the personnel involved in nuclear safety and security activities shall respect each other's way of thinking and make efforts for harmonizing both activities. Senior managers shall take responsibility to select the most appropriate solution.

8. NRA Meetings (April 1, 2021 - March 31, 2022)

No.	Date	Deliberation Topic
1	4.7	・Preparation of a Review and Inspection Guide for Ergonomics Design and Development (draft) ・Actions based on an "Interim Summary of Investigation and Analysis of TEPCO's Fukushima Daiichi NPS Accident" (2nd) ・Outline of the FY2020 Annual Report of the NRA (draft) ・Status of review on conformity of nuclear power plants to new regulatory requirements ・Status of review, etc. for conformity of nuclear fuel facilities, etc. to new regulatory requirements
2	4.9	・Exchange of views between the NRA and Chubu Electric Power Co., Inc. management
3	4.14	・Actions for handling ALPS-treated water at TEPCO's Fukushima Daiichi NPS based on government policy ・Instruction to Kashiwazaki-Kariwa NPS of TEPCO based on the provisions of Article 43-3-23 (2) of the Reactor Regulation Act (draft) ・Policy of implementing supplemental inspection for Kashiwazaki-Kariwa NPS of TEPCO ・Revisions to the guidelines for institutional improvement based on operational results of nuclear regulatory inspections in FY2020 ・Appointment of Radiation Council members (draft) ・Radiation Council meetings ・Concrete descriptions and improvement of expressions in light of review results - formulation of the implementation plan for FY2021 - ・Technical Evaluation of Japan Electric Association Standards for Eddy Current Flaw Testing, Ultrasonic Testing and Leakage Rate Testing, revisions to the interpretation of related regulations and solicitation of opinion on these matters ・Changes in NRA responses in accordance with priority preventive measures to prevent the spread of disease
4 *1	4.20	・Summary of the review report on the application for approval to change security plans due to digitalization of the reactor shutdown panel outside the main control room at Takahama PS of Kansai Electric Power Co., Inc. ・Revisions to the review standards for physical protection measures for nuclear facilities (No. 2) ・Status of nuclear regulatory inspection in the physical protection area
5	4.21	・Partial revisions to the interpretation of regulations on the standards for the position, structure and equipment of commercial nuclear power reactors and associated facilities for incorporating the standard spectrum into regulations - results of soliciting public comments for draft revisions and correspondent correction and future approach - ・Appointment of emergency response members (draft) ・Formation of the Basic Policy for Emergency Response Training ・Results of request of scientific and technological views on requirements for faults in regulatory requirements for mid-depth disposal ・Assessment of accidents and failures in nuclear fuel material usage facilities, etc. and specified nuclear facilities in FY2020 ・Progress of investigation on the cause of cracks in pressurizer spray line pipe of Ohi PS Unit 3 of Kansai Electric Co., Inc. (subsequent report)

6	4.28	・ Approval of change in basic design at Genkai NPS Units 3 and 4 of Kyushu Electric Power Co., Inc. (draft) - installation of a spent fuel dry storage facility - ・ Approval of decommissioning plans for Fukushima Daini NPS Units 1 to 4 of TEPCO (draft) ・ Approval of decommissioning plans for Toshiba Nuclear Critical Assembly (NCA) at Nuclear Engineering Laboratory of Nuclear Engineering Laboratory of Toshiba Energy Systems & Solutions Corp. ・ Appointment of the National Research and Development Agency Council members ・ Evaluation of TEPCO by third parties ・ Results of request of scientific and technological views on requirements for faults in regulatory requirements for mid-depth disposal (2nd)
7	5.12	・ Appointment of review members at the Reactor Safety Examination Committee and Nuclear Fuel Safety Examination Committee (draft) ・ Plans for implementing private standards ・ The purpose of the review guides (2nd) ・ Outline of the results of the 45th Technical Information Committee Meeting ・ Implementation of study on physical protection by the Regulatory Standard and Research Department ・ Research on radiological protection in the Regulatory Standard and Research Department Views of operators of commercial power reactors on the “Interim Summary of Investigation and Analysis of TEPCO’s Fukushima Daiichi NPS Accident” (reply of questionnaire from power reactor licensee)
8	5.19	・ Permission for basic design change at Mihama PS Unit 3, Takahama PS Units 1 to 4 and Ohi PS Unit 4 of Kansai Electric Power Co., Inc. (draft) - responses to review on the eruption scale of Daisen-Namatake tephra from Daisen Volcano - ・ Results of nuclear regulatory inspections in the 4th quarter of FY2020 ・ Inspection results and comprehensive assessment in FY2020 ・ Results of safeguards activities in Japan in 2020
9 *2	5.20	・ Details of the subsequent inspection of Kashiwazaki-Kariwa NPS of TEPCO ・ Report on unauthorized access event (interim report)
10	5.26	・ Annual Report of the NRA in FY2020 (draft) ・ State of review of conformity to new regulatory requirements and draft of future review policy for Experimental Fast Reactor Facility Joyo at the Oarai Research and Development Institute (south area) of the JAEA ・ Arbitrary decisions in the 4th quarter of FT2020
11	6.2	・ Draft revisions to the basic policies for human resource development for NRA officials ・ Solicitation of public comments on draft revisions to the NRA Guide for Emergency Preparedness and Response (clarification of persons requiring evacuation in a facility site emergency) ・ Evaluation of accidents and failures in sites handling radioisotopes, etc. in FY2020
12	6.9	・ Concrete descriptions and improvement of expressions in light of review results - formulation of implementation plans in FY2021 for special facilities for severe accident management - ・ Status of review on improvement of obligatory report based on the Reactor Regulation Act ・ Review of period of retaining nuclear regulatory inspections including information on physical protection and record of interview with nuclear operators, etc. ・ Results of on-site inspections in FY2020 in registered organizations that perform inspections based on the Radioisotope Regulation Act ・ Results of exchanging views at the Meeting on Continuous Improvement of Safety Evaluation of Commercial Power Reactors (report)

13	6.16	・Results of the review on the need to change design basis ground motion to incorporate standard response spectrum into regulations (Takahama PS and Ohi PS of Kansai Electric Power Co., Ltd.) ・Results of ex-post and interim evaluations for safety research (draft) ・The purpose of the review guides (3rd) ・Latest review reports from RSEC and NFSEC
14 *3	6.16	・Status of supplemental inspections at Kashiwazaki-Kariwa NPS of TEPCO
15	6.23	・Summary of review results on application for approval to change basic design at Shimane NPS Unit 2 of Chugoku Electric Power Co., Inc. (draft) ・Summary of review results on application for approval to change operations of category 2 waste disposal at the enrichment and disposal site of Japan Nuclear Fuel Ltd. (draft) ・Substantiation of descriptions and improvement of expressions in regulatory requirements based on review results - development of interpretation, etc. of related regulations to improve expressions ・Technological evaluation of the Atomic Energy Society of Japan on “the basic procedure for the method to determine radioactivity concentration of waste subjected to mid-depth disposal” ・Consolidation of responses to large-scale damage in Experimental Fast Reactor (Joyo) ・Release of the 2020 Safeguards Statement by the International Atomic Energy Agency (IAEA)
16 ※4	6.23	・Method of proceeding with the formulation of draft revisions to the review standards for physical protection measures for nuclear facilities regarding information system security
17	6.30	・Revision of the NRA’s Business Continuity Plan (Countermeasures for the Tokyo Inland Earthquake) ・Draft revisions to category 2 waste disposal and clearance ・Outline of the results of the 46th Technical Information Committee ・Report of the status of studies on techniques to evaluate the significance of inspection findings at fabrication facilities
18 *5	6.30	・Status of review on application for approval to change basic design for the installation of special facilities for severe accident management at Tokai Daini NPS of Japan Atomic Power Company (report) ・Status of supplemental inspections at Kashiwazaki-Kariwa NPS of TEPCO
19	7.7	・Results of the review on the need to change design basis ground motion to incorporate standard response spectrum into regulations (Genkai NPS of Kyushu Electric Power Co., Inc.) ・Draft revisions to the evaluation guide for safety research projects and resulting changes in ex-post evaluation (draft) and interim evaluation (draft) ・The concept of ground motion and its application in seismic design at TEPCO’s Fukushima Daiichi NPS based on the earthquake off the coast of Fukushima Prefecture on February 13, 2021 ・Status of review on conformity of nuclear power plants to new regulatory requirements
20	7.14	・Method of proceeding with safety research after FY2022 ・Draft review on research structure of the Regulatory Standard and Research Department ・Results of the NRA Human Resource Development Program and future implementation plan ・Revisions to the guides for institutional improvement based on operational results of nuclear inspections in FY2020 (2nd) ・Revisions to the guide to confirm the appropriateness of operator’s probabilistic risk assessment (PRA) model used in nuclear regulatory inspections and confirmation of PRA for containment functional failure at Ikata PS Unit 3
21	7.21	・Permission of change in category 2 waste disposal operation at the enrichment and disposal site of Japan Nuclear Fuel Ltd. (draft)

		・ Streamlining of the interpretation, etc. of regulations on technical evaluation for the standards of Japan Electrical Association for eddy current tests, ultrasonic tests and leakage tests ・ Partial revisions to the specification of internationally controlled materials based on the provisions of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors (Public Notice) with the revision of the Japan-UK Nuclear Co-operation Agreement ・ Revisions to the NRA Guide for Emergency Preparedness and Response (clarification of persons requiring evacuation in a facility site emergency) ・ Annual performance evaluation, expectant evaluation at the end of the period of medium to long-term goals and action to formulate the next medium to long-term goals of the JAEA ・ Policy for response to seismic reinforcement of the maintenance building for the Experimental Fast Reactor Facility (Joyo) at the JAEA's Oarai Research and Development Institute (South Area) ・ Reexamination of the evaluation formula of the continuous tsunami wave pressure in NRA technical reports - responses, etc. to inspection findings at the 40th FY2020 NRA Commission Meeting - ・ Situation of management of administrative documents
22 *6	7.21	・ Status of review on application for permission of change in basic design for installation of special facilities for severe accident management at Tokai Daini NPS of Japan Atomic Power Co. (report) (2nd) ・ Status of supplemental inspections at Kashiwazaki-Kariwa NPS of TEPCO
23	7.28	・ Comments of external experts on the NRA's administrative review of FY2021 ・ Status of implementation of nuclear regulatory inspections to investigate and analyze the cause of rewriting of boring log data at Tsuruga NPS Unit 2 of Japan Atomic Power Co. (progress report) ・ Results of nuclear regulatory inspections, etc. in the 1st quarter of FY2021
24 *7	7.28	・ Decisions on requests for a review and petition for a stay of execution regarding permission to change basic design, approval of construction plans, approval of operational period extension and approval of change in operational safety programs at Tokai Daini NPS of Japan Atomic Power Co. ・ Results of nuclear regulatory inspections, etc. in the 1st quarter of FY2021 (physical protection)
25	8.18	・ Results of study at "the Study Team on Continuous Improvement of Safety" ・ Handling of review on conformity to new regulatory requirements at Tsuruga NPS Unit 2 of Japan Atomic Power Co. ・ Formulation of the review guide for approval of nuclear fuel material usage and review standards for decommissioning plans ・ Examination of improvement in the reports based on the Reactor Regulation Act and future approaches (2nd) ・ Report of results of emergency drills by operators and approaches in this fiscal year ・ Outline of the results of the 47th Technical Information Committee Meeting ・ Outline of the results of the 48th Technical Information Committee Meeting and method of proceeding with future study on the incorporation of knowledge of hydrogen protection in regulations
26	8.25	・ Performance evaluation of the Japan Atomic Energy Agency (under co-management with the NRA) (draft) ・ Performance evaluation (under co-management with the NRA) of JAEA in FY2020 (draft) ・ Policy evaluation report on policies implemented in FY2020, a pre-analysis table to evaluate policies implemented in FY2021 (draft) and status of implementation of actions for the need of improvement and corrective measures in FY2020 (report) ・ Omission of procedure for storing thorium at Kyoto University Critical Assembly (KUCA) and response policy ・ Response policy to an inquiry for holding the ICRP International Symposium (2023) in Japan ・ Status of review on application for approval to change implementation plans

		(discharge of ALPS-treated water) at TEPCO's Fukushima Daiichi NPS (1st)
27	8.25	・ Exchange of opinions between the NRA and the Tohoku Electric Power Co. Inc. management
28	9.1	・ Results of the review on the need to change design basis ground motion with the incorporation of standard response spectrum in regulations (Mihama PS of Kansai Electric Power Co., Inc.) ・ History of disposal of an undisclosed review guide by mistake by Chugoku Electric Power Co., Ltd. ・ Study on the decision criteria, etc. to confirm the termination of decommissioning of nuclear facilities (2nd) ・ Status of pre-service operator inspections and confirmation of the integrity of embedded hardware at the Reprocessing Plant of JNFL ・ FY2022 NRA budget request and organization/capacity request ・ Response of the NRA Secretariat in situation where natural disasters are a concern
29	9.1	・ Exchange of opinions between the NRA and the Shikoku Electric Power Co., Inc. management
30	9.8	・ Ex-post evaluation of Radiation Safety Research Promotion Program (report) ・ The concept of ground motion and its application in seismic design at TEPCO's Fukushima Daiichi NPS based on the earthquake off the coast of Fukushima Prefecture on February 13, 2021 (2nd) ・ Report of cases evaluated as a severity level of "SLIV (notified)" in nuclear regulatory inspections ・ Arbitrary decisions in the first quarter of FY2021 (report)
31 *8	9.8	・ Feedback from operators on the outline of revisions to the review standards for physical protection measures for nuclear facilities (information system security) and method of proceeding with study based on this ・ Report on unauthorized access event (final report)
32	9.15	・ Permission of change in basic design (draft) at Shimane NPS of Chugoku Electric Power Co., Inc. ・ Results of the review on the need to change design basis ground motion incorporating the standard response spectrum in regulations (Onagawa NPS of Tohoku Electric Power Co., Inc.) ・ Status of review on an application for approval to change the design and construction plan for the reprocessing plant and MOX fuel fabrication facility of Japan Nuclear Fuel Limited
33 *9	9.15	・ Status of review on an application for approval to change basic design for installing special facilities for severe accident management at Tokai Daini NPS of Japan Atomic Power Co. (report) (3rd) ・ Status of supplemental inspections at Kashiwazaki-Kariwa NPS of TEPCO ・ Status of nuclear regulatory inspections in the physical protection area
34	9.22	・ Report on items requiring improvement and status of corrective measures to the NRA ・ Report from the Study Team on Monitoring Thyroid Gland Exposure Dose in an Emergency
35	9.29	・ Approval of the Decommissioning Plan for the Fast Critical Assembly (FCA) at the Nuclear Science Research Institute of the JAEA (draft) ・ Revisions to regulations related to category 2 waste disposal and clearance and development of a review guide for intermediate-depth disposal ・ Receipt of a report on remedial actions at Kashiwazaki-Kariwa NPS of TEPCO and future and future response ・ Outline of the results of the International Atomic Energy Agency (IAEA) General Conference and the International Nuclear Regulators Association (INRA)
36	10.6	・ The NRA's response to the cancellation of emergency declaration ・ Status of the review for compliance with the new regulatory requirements for nuclear power plants ・ Status of the review for compliance with the new regulatory requirements for nuclear fuel cycle facilities, etc. ・ Outline of the results of the 49th Technical Information Committee

37	10.13	・ Proposed establishment of review standards for decommissioning plans for nuclear fuel material usage facilities, etc. not subject to Article 41 of the Cabinet Order, and solicitation of public comments ・ Reexamination of development of a review guide for approval to use nuclear materials ・ Report on the results of the review at the 8th Basic Reactor Safety Subcommittee Meeting / the 2nd Basic Nuclear Fuel Safety Subcommittee Meeting
38 *10	10.13	・ Direction of revisions to the review standards for information system security measures and policy on response to operators' opinions (1st) ・ Investigation to contribute to a specific of required standard for physical protection ・ Supplemental inspection (Phase II) plan based on the report on remedial actions at Kashiwazaki-Kariwa NPS of TEPCO
39	10.20	・ Supplemental inspection (Phase II) plan based on the report on remedial actions at Kashiwazaki-Kariwa NPS of TEPCO ・ Draft revisions to the guide for items set forth in the Radiation Hazards Prevention Program (assurance of radiation measurement reliability) and solicitation of public comments ・ Outline of the Japanese version of the Information Notice system
40	10.20	・ Exchange of opinions between the NRA and the JAEA management
41	10.27	・ Type certification of design of specified equipment for nuclear power reactor facilities (Mitsubishi Heavy Industries, Ltd.) (draft) ・ Direction of revisions to the "Facility Requirements for Nuclear Emergency Core Hospitals, etc. ・ Revisions, etc. to the interpretation of regulations relating to the seismic isolation of buildings and structures and solicitation of public comments ・ Results of surveys on confirmation of the location of identification cards, etc. issued for the personnel of the NRA Secretariat (report)
42 *11	10.27	・ Direction of revisions to the review standards for information system security measures and policy on response to operators' opinions (2nd) ・ Substantiation of descriptions and improvement of expressions in regulatory requirements based on review results - draft partial revision to the interpretation of related regulation in accordance with the FY2021 implementation plan for special facilities for severe accident management -
43	11.2	・ Substantiation of descriptions and improvement of expressions in regulatory requirements based on review results - solicitation of public comments in accordance with the FY2021 implementation plan for special facilities for severe accident management ・ Response to the development of the next medium to long-term goals of the JAEA ・ Inconsistency of analysis specification for Sr-90 in undersea soil off the coast of Fukushima and corrective measures (report) ・ Status of implementation of nuclear regulatory inspections for rewriting boring log data at Tsuruga NPS Unit 2 of Japan Atomic Power Co.
44	11.10	・ Damage to piles of the building for carrying in large items at Kashiwazaki-Kariwa NPS Unit 6 ・ Report on the notice to Global Nuclear Fuel Japan based on the results of nuclear regulatory inspections ・ Outline of the results of the 50th Technical Information Committee Meeting ・ Carrier path image of NRA officials (carrier positions, general positions (clerical position))
45	11.17	・ Results of nuclear regulatory inspections in the 2nd quarter of FY2021 ・ Revisions to the policy to ensure transparency of administration of the NRA (draft) ・ Response to the development of the next medium to long-term goals of the JAEA (2nd) ・ Outline of the results of the expert meeting on nuclear safety held by the IAEA at the 10th anniversary of the TEPCO's Fukushima Daiichi NPS accident
46 *12	11.17	・ Direction of revisions to the review standards for information system security measures and policy on response to operators' opinions (3rd) ・ Results of nuclear regulatory inspections at the 2nd quarter of FY2021 (related to physical protection)

		・ Status of supplemental inspections at Kashiwazaki-Kariwa NPS of TEPCO
47	11.24	・ Approval to change basic design concerning the technical assessment of aging management at Ohi PS Unit 3 of Kansai Electric Power Co., Inc. (draft) ・ Compilation of draft review results of an application for approval to change basic design at Kyoto University's Institute for Integrated Radiation and Nuclear Science (modification of critical assembly) (draft) - addition of a storage for low-enriched fuel and thorium ・ Policy of future response to the leak of nuclear materials, etc. outside the controlled area at Toshiba Materials Co., Ltd. ・ Enhancement of inspections on fire protection
48 *13	11.24	・ Review report on the application for change in basic design relating to the specialized safety facility of Tokai Daini NPS of Japan Atomic Power Co. (draft)
49	12.1	・ Summary of review results on applications for approval to change basic design at Tokai Daini NPS of Japan Atomic Power Co. (draft) - installation of special facilities for severe accident management and a permanent DC power supply (3rd system) in the station - ・ Supplementary budget in FY2021 ・ Arbitrary decisions in the 2nd quarter of FY2021 ・ Outline of the results of the 13th Top Regulators' Meeting on Nuclear Safety among China, Japan and Korea (TRM)
50	12.8	・ Results of the review on the need to change design basis ground motion to incorporate standard response spectrum into regulations (Shimane NPS Unit 2 of Chugoku Electric Power Co., Inc.) ・ Technical Evaluation of Japan Electric Association Standards for Digital Safety Protection Systems ・ Status of review on the introduction of knowledge on hydrogen protection into regulations (interim report) ・ Results of the selection in the NRA Human Resource Development Program in FY2021
51	12.8	・ Exchange of views between the NRA and the Kansai Electric Power Company's management
52	12.15	・ The NRA's comments on "FY2021 Comprehensive Nuclear Emergency Response Drill" (draft) ・ Establishment of review standards for decommissioning plans for facilities, etc. not subject to Article 41 of the Cabinet Order and the results of soliciting public comments ・ Draft revisions, etc. to regulations related to the improvement in obligated reports based on the Reactor Regulation Act and solicitation of public comments for draft revisions ・ Revisions to "Ordinary Radiation Monitoring" and "Emergency Radiation Monitoring" (both are supplementary reference materials for NRA Guide for Emergency Preparedness and Response)
53	12.15	・ Exchange of views between the NRA and the Chugoku Electric Power Company's management
54	12.22	・ Permission of change in basic design at Tokai Daini NPS of Japan Atomic Power Co. (draft) - installation of special facilities for severe accident management and a permanent DC power supply (3rd system) in the station and change in the facilities included in design criteria and special facilities for severe accident management - ・ Analysis of the February 13, 2021 earthquake off the coast of Fukushima Prefecture ・ Response to applications for approval to change implementation plans at TEPCO's Fukushima Daiichi NPS (facilities for the discharge of ALPS-treated water into the sea)
55 *14	12.22	・ Revisions to the review standards, etc. for physical protection measures for nuclear facilities (draft) and feedback from operators ・ Status of supplemental inspections at Kashiwazaki-Kariwa NPS of TEPCO
56	1.5	・ Status of review of conformity of nuclear power stations to new regulatory requirements

		・ Status of decommissioning of the Reprocessing Facility of Nuclear Fuel Cycle Engineering Laboratories of the JAEA ・ Outline of the NRA's proposed initial budget for FY2022
57	1.5	・ Exchange of opinions between the NRA and the Kyushu Electric Power Company's management
58	1.12	・ Omission of accompanying documents for the application for approval to change the installation of Kyoto University Critical Assembly (KUCA) and policy of response ・ Response based on the alert-level event at the Kinki University (revisions to the emergency action levels and clarification of measures for determining when to withdraw the emergency status) ・ Japanese version Information Notice system (draft)
59	1.12	・ Exchange of opinions between the NRA and the management of Japan Nuclear Fuel Ltd.
60	1.19	・ Revisions to the NRA's Business Continuity Plan (Countermeasures for the Tokyo Inland Earthquake) ・ Results of safety research evaluation (pre-evaluation) (draft) ・ Confirmation of views of operators for the Interim Summary of Investigation and Analysis of TEPCO's Fukushima Daiichi NPS Accident ・ Draft revisions, etc. to regulations related to the improvement in obligated reports based on the Reactor Regulation Act and solicitation of public comments for draft revisions, etc. (2nd) ・ Study on matters to be considered at least to ensure safety in geological disposal (1st) - draft study policy -
61 *15	1.19	・ Selection of Radiation Council members ・ Status of supplemental inspections at Kashiwazaki-Kariwa NPS of TEPCO
62	1.26	・ Summary of review results on applications for permission of change in basic design at Tokai Daini NPS of Japan Atomic Power Co. (draft) - installation of a volume-reduction system - ・ Type certification of design of specified equipment for nuclear power reactor facilities (Hitachi-GE Nuclear Energy Ltd.) (draft) ・ Policy of the application of fire protection review standards to fire detectors installed at nuclear power reactor facilities ・ Draft revisions to the NRA Guide for Emergency Preparedness and Response (thyroid dose monitoring and medical systems for nuclear disaster) ・ Draft revisions to the "Facility Requirements for Nuclear Emergency Core Hospitals, etc." and solicitation of public comments
63	2.2	・ Development of the next medium to long-term goals of the JAEA ・ Revision, etc. to the interpretation of regulations relating to the seismic isolation of buildings and structures (draft) ・ Revisions to the Mid-term Risk Reduction Target Map for TEPCO's Fukushima Daiichi NPS (1st) ・ Study on matters to be considered at least to ensure safety in geological disposal (2nd) - draft study policy -
64	2.9	・ A draft review guide for the category 2 waste disposal site ・ A draft guide for judging conditions of site soil, etc. in confirming the completion of decommissioning ・ Operator's emergency response training and method of proceeding with study on regulatory involvement ・ Method of proceeding with study on document formulation on back fitting ・ Draft method of proceeding with exchange of opinions between the NRA and nuclear operators (management)
65	2.16	・ Results of nuclear regulatory inspections, etc. at the 3rd quarter of FY2021 ・ Status of review on applications for approval to change implementation plans at TEPCO's Fukushima Daiichi NPS (facilities for discharging ALPS-treated water into the sea) ・ Strengthening and expansion of sea-area monitoring based on government policy for discharging ALPS-treated water into the sea at TEPCO's Fukushima Daiichi NPS

		・ Report of the results of discussions on the screening procedure for inspection findings in the uranium processing plant ・ Review result report from the joint meeting of the Reactor Safety Examination Committee and the Nuclear Fuel Safety Examination Committee ・ Outline of the results of the 51st Technical Information Committee Meeting
66 *16	2.16	・ Results of nuclear regulatory inspections, etc. at the 3rd quarter of FY2021 (physical protection) ・ Status of supplemental inspections at Kashiwazaki-Kariwa NPS of TEPCO
67 *17	2.18	・ Replies to questions on Japan's 7th national report submitted to the Joint Convention (draft)
68	2.24	・ Revisions, etc. to the interpretation of regulations relating to the seismic isolation of buildings and structures (draft) (2nd) ・ Appointment of the Radiation Council members (draft) ・ Draft revisions to the Review Guide for Seismic Isolation of Buildings and Structures ・ Status of conformity to new regulatory requirements of the Experimental Fast Reactor Facility (Joyo) at the JAEA's Oarai Research and Development Institute (South Area) - validity of analysis codes used for efficacy assessment - ・ Arbitrary decisions in the 3rd quarter of FY2021 (report)
69	3.2	・ Release of the NRA's initiatives (March 11 report) (draft) ・ Management review for FY2021 ・ Revisions to the Mid-term Risk Reduction Target Map for TEPCO's Fukushima Daiichi NPS (2nd)
70	3.9	・ The next medium to long-term plans of the JAEA (under co-management with the NRA) and approval procedure ・ Permission of changes in basic design at Tokai Daini NPS of Japan Atomic Power Co. (draft) - installation of a volume-reduction system - ・ Results of the review on the need to change design basis ground motion to incorporate standard response spectrum into regulations (JRR-3 at the JAEA's Nuclear Science Research Institute) ・ Publication of the NRA's initiatives (March 11 report) (draft) (2nd) ・ Management review for FY2021 (2nd) ・ Revisions to the Mid-term Risk Reduction Target Map for TEPCO's Fukushima Daiichi NPS (3rd)
71	3.16	・ Revisions to the NRA Organization Regulation (draft) ・ Partial revisions to the guide for items set forth in the Radiation Hazards Prevention Program (assurance of radiation measurement reliability) ・ Revision or enactment of rules for improving obligated reports based on the Reactor Regulation Act (draft) ・ FY2022 Implementation Plan of the NRA Human Resource Development Program ・ Basic policy for the inspection of plans to be implemented at TEPCO's Fukushima Daiichi NPS in FY2022
72 *18	3.16	・ Replies to questions on the Japan's 7th national report submitted to the Joint Convention (draft) (2nd)
73	3.23	・ Approval to change the Decommissioning Plan for Mihama PS Units 1 and 2 of Kansai Electric Power Co., Inc. (draft) - changes embodying details of the decommissioning plan after stage phase 2 - ・ Results of the review on the need to change design basis ground motion to incorporate standard response spectrum into regulations (Kashiwazaki-Kariwa NPS Units 6 and 7 of TEPCO) ・ NRA Annual Operational Plan for FY2022 ・ Policy evaluation implementation plan and results for FY2022 and the status of their reflection in the policy (published in FY2021) ・ Revisions to the NRA Guide for Emergency Preparedness and Response (thyroid dose monitoring and medical systems for nuclear disaster) ・ Establishment of the "Designation Requirements for Nuclear Emergency Core Hospitals and Their Roles (overall revisions to the "Facility Requirements to Nuclear Emergency Core Hospitals")

		・ Basic policy for the inspection of plans to be implemented at TEPCO's Fukushima Daiichi NPS in FY2022 (2nd)
74 *19	3.23	・ Selection of review members at the Reactor Safety Examination Committee and Nuclear Fuel Safety Examination Committee
75	3.30	・ Revisions of the interpretation of criteria and rules for approving the installation of special facilities for severe accident management ・ Establishment of a guide for judging conditions of site soil, etc. in confirming the completion of decommissioning ・ Compilation of draft review results of application for approval to change basic design (modification of the critical assembly) at the Institute for Integrated Radiation and Nuclear Science of Kyoto University (draft) - addition of a storage for low-enriched fuel and thorium - ・ Deficiency in documents and/or procedures in permissions and approvals pertaining to the revision of Article 3 and policy of corrective actions ・ Organization of ways of thinking in revising the NRA Guide for Emergency Preparedness and Response (increase in description about radiological protection measures implemented by disaster response personnel) ・ Handling of documents approved by the NRA ~ Increase in accuracy, consistency and search capability ~ ・ Outline of IAEA regulatory review meeting on the discharge of ALPS-treated water into the sea
76 *20	3.30	・ Revisions to review standards, etc. for information security measures at nuclear facilities (draft) ・ Status of supplemental inspections at Kashiwazaki-Kariwa NPS of TEPCO

*1 The 4th FY2021 Commission Meeting was closed to the public because agenda items included information on the physical protection of nuclear materials which might endanger public safety if such information and deliberations became public and known to those who plan to sabotage nuclear facilities.

*2 The 9th FY2021 Commission Meeting was closed to the public because the first agenda item was information on inspections which might hinder an accurate grasp of facts if such information and deliberations were made public. The 2nd agenda item was information on cybersecurity which might endanger public safety and affect appropriate implementation of official work at the NRA if the information and deliberations were made public and known to those who plan cyberattacks against the NRA.

*3 The 14th FY2021 Commission Meeting was closed to the public because the agenda item was information on inspections which might hinder an accurate grasp of facts and as information on physical protection was involved, endanger public safety if the information and deliberations were made public and known to those who intended to sabotage nuclear facilities.

*4 The 16th FY2021 Commission Meeting which dealt with information on physical protection was closed to the public to prevent endangering public safety if the information and deliberation were made public and known to those who intend to sabotage nuclear facilities.

*5 The 18th FY2021 Commission Meeting was closed to the public because the first agenda item was information on review on special facilities for severe accident management which might endanger public safety and order and the second agenda item was information on inspections which may hinder an accurate grasp of facts and as information on physical protection was involved, endanger public safety if the information and deliberations were made public and known to those who intend to sabotage nuclear facilities.

*6 The 22nd FY2021 Commission Meeting was closed to the public because the 1st agenda item was information on review on special facilities for severe accident management which might endanger public safety and order and the second agenda item was information on inspections which might hinder an accurate grasp of facts and as information on physical protection was involved, endanger public safety if the information and deliberations were made public and known to those who intend to sabotage nuclear facilities.

*7 The 24th FY2021 Commission Meeting was closed to the public because the 1st agenda item was to examine the appropriateness and unfairness of dispositions that NRA was deemed to have made itself and this posed a risk of hindering frank opinions from those who were involved in dispositions, thereby

the original function of the appeal for fair and neutral decision through simple procedures if the review was made public. The 2nd agenda item was information on physical protection which might endanger public safety if the information and deliberations were made public and known to those who intend to sabotage nuclear facilities.

*8 The 31st FY2021 Commission Meeting was closed to the public because the first agenda item was information on review on special facilities for severe accident management which might endanger public safety and the 2nd agenda item was about information cybersecurity which might endanger public safety and affecting appropriate implementation of official work at the NRA if the information and liberations were made public and known to those who intend to make cyberattacks against the NRA.

*9 The 33rd FY2021 Commission Meeting was closed to the public because the first agenda item was information on review on special facilities for severe accident management which might endanger public safety and order and the 2nd and 3rd items to discuss were information on inspections which might hinder an accurate grasp of facts and as information on physical protection was involved, endanger public safety if the information and deliberations were made public and known to those who intend to sabotage nuclear facilities.

*10 The 38th FY2021 Commission Meeting was closed to the public because the 1st agenda item was information on physical protection which might endanger public safety if the information and deliberations were made public and known to those who intend to sabotage nuclear facilities. The 2nd and 3rd items to discuss were information on inspections which might hinder an accurate grasp of facts and as information on physical protection was involved, endanger public safety if the information and deliberations were made public and known to those who intend to sabotage nuclear facilities.

*11 The 42nd FY2021 Commission Meeting was closed to the public because the 1st agenda item was information on physical protection which might endanger public safety and the 2nd item was information on review on special facilities for severe accident management which might endanger public safety and order if the information and deliberations were made public and known to those who intend to sabotage nuclear facilities.

*12 The 46th FY2021 Commission Meeting was closed to the public. The 1st and 2nd items to discuss were information on physical protection which might endanger public safety if the information and deliberations were made public and known to those who intend to sabotage nuclear facilities. The 3rd agenda item it was information on inspections which might hinder an accurate grasp of facts and as information on physical protection was involved, endanger public safety if the information and deliberations were made public and known to those who intend to sabotage nuclear facilities.

*13 The 48th FY2021 Commission Meeting was closed to the public because the agenda item was information on review on special facilities for severe accident management which might endanger public safety and order if the information and deliberations were made public

*14 The 55th FY2021 Commission Meeting was closed to the public because the 1st agenda item was information on physical protection which might endanger public safety if the information and deliberation were made public and known to those who intend to sabotage nuclear facilities. The 2nd agenda item was information on inspections which might hinder an accurate grasp of facts and as information on physical protection was involved, endanger public safety if the information and deliberations were made public and known to those who intend to sabotage nuclear facilities.

*15 The 61st FY2021 Commission Meeting was closed to the public because the 1st agenda item was the selection of the members of the Committee, etc. which might harm the rights and interests of individuals and hinder the securing of fair and smooth personnel affairs related to the personnel management of the Committee, etc. if the information and deliberations were made public. The 2nd agenda item was information on inspections which might hinder an accurate grasp of facts and as information on physical protection was involved, endanger public safety if the information and deliberations were made public and known to those who intend to sabotage nuclear facilities.

*16 The 66th FY2021 Commission Meeting was closed to the public because the 1st agenda item was information on physical protection which might endanger public safety if the information and deliberations were made public and known to those who intend to sabotage nuclear facilities. The 2nd agenda item was information on inspections which might hinder an accurate grasp of facts and as

information on physical protection was involved, endanger public safety if the information and deliberations were made public and known to those who intend to sabotage nuclear facilities.

*17 The 67th FY2021 Commission Meeting was closed to the public in the interests of maintaining trustworthy relationships with other countries since information on the replies to questions on the national report for the 7th review meeting of the Joint Convention on Nuclear Waste was handled.

*18 The 72nd FY2021 Commission Meeting was closed to the public in the interests of maintaining trustworthy relationships with other countries since information on the replies to questions to the reports for individual countries for the 7th review meeting of the Joint Convention on Nuclear Waste was handled.

*19 The 74th FY2021 Commission Meeting was closed to the public because the agenda item was the selection of the members of the Committee which might harm the rights and interests of individuals and hinder the securing of fair and smooth personnel affairs related to the personnel management of the Committee if the information and deliberations were made public.

*20 The 76th FY2021 Commission Meeting was closed to the public because the1st agenda item was information on physical protection which might endanger public safety if the information and deliberation were made public and known to those who intend to sabotage nuclear facilities. The 2nd agenda item was information on inspections which might hinder an accurate grasp of facts and as information on physical protection was involved, endanger public safety if the information and deliberations were made public and known to those who intend to sabotage nuclear facilities.

9. Decisions by NRA (April 1, 2021 - March 31, 2022)

Date of determination	Decision made in Committee
4.7	・ Publication of the results of soliciting public comments on and establishment of the Review and Inspection Guide for Ergonomics Design and Development
4.14	・ Issuance of an order to TEPCO based on the provisions of Article 43-3 ・ -23 (2) of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors ・ Appointment of the Radiation Council members
4.21	・ Partial revisions of the interpretation of regulations on the standards for the position, structure and equipment of commercial power reactors and associated facilities to incorporate standard response spectrum into regulations ・ Instruction documents for partial revisions of the interpretation of regulations on the standards for the position, structure and equipment of commercial power reactors and associated facilities to incorporate standard response spectrum into regulations ・ Appointment of the immediate emergency response members
4.28	・ Permission of change in basic design at Genkai NPS (changes in equipment at Units 3 and 4) (dry cask) ・ Approval of the decommissioning plan for Fukushima Daini NPS Unit 1 ・ Approval of the decommissioning plan for Fukushima Daini NPS Unit 2 ・ Approval of the decommissioning plan for Fukushima Daini NPS Unit 3 ・ Approval of the decommissioning plan for Fukushima Daini NPS Unit 4 ・ Approval of decommissioning plans for Toshiba Nuclear Critical Assembly (NCA) at Toshiba Nuclear Engineering Laboratory, Toshiba Energy Systems and Solution Corporation
5.12	・ Appointment of review members at the Reactor Safety Examination Committee and Nuclear Fuel Safety Examination Committee
5.19	・ Permission of change in basic design at Ohi PS (changes in installation at Units 3 and 4) (response to the revision of the eruption scale of the Daisen-Namatake Tephra of Daisen Volcano) ・ Permission of change in basic design at Mihama PS (changes in reactor facilities at Unit 3) (response to the revision of the eruption scale of the Daisen-Namatake Tephra of Daisen Volcano) ・ Permission of change in basic design at Takahama PS (changes in reactor facilities at Units 1 to 4) ((response to the revision of the eruption scale of the Daisen-Namatake Tephra of Daisen Volcano)
5.26	・ Decision and publication of the NRA Annual Report for FY2020
6.2	・ Revisions of the “Basic Policy on Human Resource Development for NRA Staff”
6.16	・ Need to change design basis ground motion to incorporate standard response spectrum into regulations (Takahama PS and Ohi PS of Kansai Electric Power Co., Inc.)
6.23	・ Application for approval to change basic design at Shimane NPS of Chugoku Electric Power Co., Inc. (change of reactor facilities at Unit 2) (hearing of opinions) ・ Hearing of opinions, etc. on the permission of change in category 2 waste disposal operation at the enrichment and disposal site of Japan Nuclear Fuel Ltd. ・ Substantiation of descriptions and improvement of expressions in regulatory requirements in consideration of review results - publication of the results of public comments for FY2020 implementation plan and revisions - (partial revisions on October 27)
6.30	・ Revisions of the NRA’s Business Continuity Plan (Countermeasures for the Tokyo Inland Earthquake)
7.7	・ Need to change design basis ground motion to incorporate standard response spectrum into regulations (Genkai NPS of Kyushu Electric Power Co., Inc.)
7.21	・ Permission of change in category 2 waste disposal operation at the enrichment and disposal site of Japan Nuclear Fuel Ltd. ・ Publication of the results of soliciting public comments on draft revisions to the technical evaluation for the standards of Japan Nuclear Fuel Ltd. for eddy current tests, ultrasonic tests and leakage tests and to the interpretation of related regulations and formulation and revisions of the regulations

	・ Public notice for partial revisions to the specification of internationally controlled materials based on the provisions of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors ・ Publication of the results of soliciting public comments for draft revisions to the NRA Guide for Emergency Preparedness and Response, partial revisions of the NRA EPR Guide and partial revisions of "Distribution and Administration of Stable Iodine"
7.28	・ Decisions on whether to issue requests for review and make petitions for stay of execution pertaining to permission, etc. for basic design at Tokai Daini NPS of Japan Atomic Power Company
8.25	・ Evaluations and revisions of the operational performance of the JAEA at the end of FY2020 and the 3rd medium to long-term goals (under co-management with the NRA) ・ Evaluation of operational performance of the National Institutes for Quantum Science and Technology in FY2020 (under co-management with the NRA) ・ Policy evaluation report on policies implemented in FY2020 and a pre-analysis table to evaluate policies implemented in FY2021
9.1	・ Need to change design basis ground motion to incorporate standard response spectrum into regulations (Mihama PS of Kansai Electric Power Co., Inc.)
9.15	・ Permission of change in basic design at Shimane NPS of Chugoku Electric Power Co., Inc. (change in nuclear power reactor facilities at Unit 2) ・ Need to change design basis ground motion to incorporate standard response spectrum into regulations (Onagawa NPS of Tohoku Electric Power Co., Inc.)
9.29	・ Approval of the decommissioning plan for the Fast Critical Assembly (FCA) at JAEA's Nuclear Science Research Institute ・ Revisions to regulations related to category 2 waste disposal and clearance and development of a review guide for intermediate-depth disposal ・ Partial revisions of review standards for the decision of dispositions made by the NRA based on the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors, etc.
10.27	・ Type certification of design of specified equipment for nuclear power reactor facilities (Mitsubishi Heavy Industries, Ltd. (specific dual-use cask (type MSF-24P(S))
11.17	・ Revisions of policy to ensure transparency of administration work of the NRA
11.24	・ Approval of change in the reactor operational safety program at Ohi PS of Kansai Electric Power Co., Inc. (addition of a policy for long-term facility management at Unit 3)
12.1	・ Application for approval to change basic design at Tokai Daini NPS (changes in power reactor facilities) (hearing of opinions) (installation of special facilities for severe accident management, etc.)
12.8	・ Need to change design basis ground motion to incorporate standard response spectrum into regulations (Shimane NPS Unit 2 of Chugoku Electric Power Co., Inc.)
12.15	・ Hearing of opinions (replies) on the FY2021 Comprehensive Nuclear Emergency Response Drill ・ Publication of the results of soliciting public comments on the review standards for decommissioning plans for nuclear fuel material usage facilities, etc. not subject to Article 41 of the Cabinet Order ・ Partial revisions of review standards for the decisions of disposition made by the NRA based on Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors, etc.
12.22	・ Permission of change in basic design at Tokai Daini NPS (changes in power reactor facilities) (installation of special facilities for severe accident management, etc.)
1.19	・ Revisions of the NRA's Business Continuity Plan (Countermeasures for the Tokyo Inland Earthquake)
1.26	・ Permission of change in basic design at Tokai Daini NPS of Japan Atomic Power Co. (changes in nuclear power reactor facilities) (installation of a volume-reduction system) (hearing of opinions) ・ Type certification of design of specified equipment for nuclear power reactor facilities (Hitachi-GE Nuclear Energy (specific dual-use cask (type HDP-69BCH(B))
2.24	・ Publication of the results of soliciting public comments on revisions, etc. of the interpretation of regulations relating to the seismic isolation of buildings and structures

	and formulation and revisions of the regulations. ・ Appointment of the Radiation Council members
3.9	・ Permission of change in basic design at Tokai Daini NPS of Japan Atomic Power Co. (changes in nuclear power reactor facilities) (installation of a volume-reduction system) ・ Need to change design basis ground motion to incorporate standard response spectrum into regulations (JRR-3 reactor facility of the JAEA) ・ Decision and announcement of "the NRA initiatives" (partial revision on March 11)
3.16	・ Proposed rules for revising part of the NRA Organization Regulation ・ Partial revisions to the guide for items set forth in the Radiation Hazards Prevention Program (assurance of radiation measurement reliability) ・ Publication of the results of soliciting public comments for draft revisions to rules for improving obligated reports based on the Reactor Regulation Act and revision or enactment of related rules
3.23	・ Approval of change in decommissioning plans for the power reactor facilities of Mihama PS Unit 1 (changes, etc. in accordance with vested Stage 2 and subsequent decommissioning plans) ・ Approval of change in decommissioning plans for the power reactor facilities of Mihama PS Unit 2 (changes, etc. in accordance with vested Stage 2 and subsequent decommissioning plans) ・ Need to change design basis ground motion to incorporate standard response spectrum into regulations (Kashiwazaki-Kariwa NPS Units 6 and 7 of TEPCO) ・ Decision of the NRA Annual Operating Plan for FY2022 ・ Decision of policy evaluation implementation plan and policy evaluation results of NRA for FY2022 and the status of their reflection in the policy (published in FY2021)
3.30	・ Revisions of the interpretation of standard regulations on the design and construction plan for special facilities for severe accident management (publication of the public comment solicitation results and decision of draft revisions) ・ Establishment of a guide for judging conditions of site soil, etc. in confirming the completion of decommissioning ・ Hearing opinions, etc. on change in basic design (modification of the critical assembly) at the Institute for Integrated Radiation and Nuclear Science of Kyoto University ・ Article by article description of regulations on physical protection measures for nuclear material and partial revisions of expression guide for physical protection programs

10. View on the relationship between review of approval for operation period extension and aging deterioration of nuclear power plants during long shutdowns

July 29, 2020
NRA

On July 22, 2020, NRA received a report from the Secretariat of the NRA on the "Results of working-level technical discussions with ATENA on aging management". This exchange of opinions was triggered by a suggestion from the operator that a certain period of time should be excluded from the operation period in the review of the approval for the extension of the operation period, because the degradation of safety-important facilities during the shutdown period is not considered to be a technical problem. NRA has been stating for some time that it is not in a position to express its opinion on the nature of the operation period, but on the occasion of receiving the report on the above-mentioned technical opinion exchange meeting, NRA would like to take this opportunity to explain our view again.

1. The role of NRA with regard to nuclear facilities for power generation is limited to setting standards from a scientific and technical perspective, examining individual facilities to determine whether they conform to those standards, and monitoring them through inspections. Planning, drafting, and implementation of policies concerning the justification of the use of nuclear facilities for power generation and other matters related to the use of nuclear facilities fall under the function of promoting the use of nuclear energy, and are not matters that NRA should be involved in.

2. Article 43-3-32 of the Nuclear Reactor Regulation Law stipulates that the period during which reactors for power generation may be operated is 40 years from the start of operation (the date on which the first pre-service inspection is passed), and that the period may be extended only once with the approval of NRA upon expiration of the period.

3. The role of NRA in this system is to evaluate, from a scientific and technical perspective, whether or not the facilities of a nuclear reactor, etc., comply with the standards specified in the technical regulations, taking into account the deterioration of the reactor, etc., during the extended period of time after a certain period of time has elapsed from the start of operation. From the standpoint of NRA, the provision of 40 years for the operation period is meant to specify the timing for such evaluation (after a certain period of time from the start of operation).

4. In the review of the approval for the extension of operation period, it is important to collect and organize the knowledge on the progress of degradation of nuclear reactors, especially on the progress of degradation of hard-to-replace components. This discussion with ATENA summarized findings on whether or not the degradation of components and structures in power reactor facilities that are difficult to replace will progress during the long-term shutdown period for each event that may cause aging. As a result, the following was confirmed.
   First of all, events such as neutron irradiation embrittlement, low-cycle fatigue,

cracking of the lower layer of the cladding, corrosion (FAC), fatigue cracking, reduction of concrete strength due to heat and radiation, and reduction of concrete shielding capacity due to heat should not be considered as degradation factors because these hard-to-replace components and structures in the power reactor facilities are not in an environment where they are exposed to radiation, large temperature or pressure fluctuations, or high speed steam flow.

On the other hand, degradation of concrete structures such as neutralization, salt penetration, alkali-aggregate reaction, mechanical vibration, strength loss due to freezing and thawing, and wear of the reactor pressure vessel stabilizers, etc., will progress during the long-term shutdown period as well as during other periods. The progress of these degradation events can be controlled by appropriate storage and inspection at each plant by each operator. However, it is necessary for the regulatory authority to confirm the appropriateness of the storage measures and inspections conducted by the operator for each individual plant. Degradation events, which would make it impossible to take appropriate storage measures and repairs, were not observed during the long-term shutdown period.

The progress of these degradation events during the long-term shutdown period should be evaluated for each individual facility according to the type of equipment, etc., because the degradation of various components and structures that constitute the power reactor facility varies and also depends on the adequacy of storage and inspection conducted by each operator at each individual plant.

5. As described in 4, depending on the type of equipment and the factors of degradation, the degree of progress of degradation differs between the long-term shutdown period and the non-long-term shutdown period, and the operator's proposal to exclude a certain period from the operation period can be considered to have been made from this perspective. However, from the standpoint of NRA, the operating period means nothing more than that the end of the period is the time when the evaluation described in 3 in the above should be conducted, and in light of 4 in the above, it is difficult to reach a scientifically and technically unique conclusion on whether or not the operating period should include the long-term shutdown period, and it is not possible to quantitatively determine a specific period of time that can be excluded as not being degraded.

On the other hand, no matter how the timing is determined, the future progress of deterioration of power reactor facilities can be evaluated scientifically and technically for each individual facility, depending on the type of equipment.

6. Thus, the period of 40 years from the start of operation in the current system itself is not the only option for the time of evaluation in 3 in the above, but was established as a legislative policy for the operation period of power reactor facilities. The decision on how long to allow the use of nuclear facilities for power generation is a policy decision on how to use nuclear energy, and not a matter for NRA to express its opinion.

11. Exchange of Opinions with Operators

(1) Exchange of Opinions between the NRA and Operators (CEOs)

Dates	Nuclear Operators
April 9, 2021	Chubu Electric Power Co., Inc.
August 25, 2021	Tohoku Electric Power Co., Inc.
September 1, 2021	Shikoku Electric Power Co., Inc.
October 20, 2021	Japan Atomic Energy Agency
December 8, 2021	Kansai Electric Power Co., Inc.
December 15, 2021	Chugoku Electric Power Co., Inc.
January 5, 2022	Kyushu Electric Power Co., Inc.
January 12, 2022	Japan Nuclear Fuel Limited

(2) Exchange of Opinions with Chief Nuclear Officers (CNOs) of Major Nuclear Facility Operators

Dates	Nuclear Operators	Main Issues of Discussions
June 10, 2021	Chubu Electric Power, TEPCO Holdings, Kansai Electric Power, Kyushu Electric Power, Atomic Energy Association (ATENA)	・ Initiatives of the whole industry based on the physical protection of nuclear material cases of TEPCO, increase in use rate and efforts for long-term operation ・ Response to key issues addressed by ATENA ・ Concerns of regulating authorities
October 15, 2021	Chubu Electric Power, TEPCO Holdings, Kansai Electric Power, Kyushu Electric Power, Atomic Energy Association (ATENA)	・ Safety Evaluation Report ・ Efforts to improve SA response capability (judging capability - on-site competence)

(3) Visits to Nuclear Facilities by NRA Commissioners

	Date	Purpose	Place of Visit (NPP, etc.)	Visiting Commissioner
1	June 21, 2021	On-site investigation	Head Office, Japan Atomic Power Co.	Commissioner Ishiwatari
2	July 27, 2021	On-site investigation	Tokai Daini Nuclear Power Station, Japan Atomic Power Co.	Commissioner Yamanaka
3	August 4-5, 2021	On-site investigation, etc.	Kashiwazaki-Kariwa Nuclear Power Station, TEPCO	Commissioner Ishiwatari
4	September 7, 2021	On-site investigation	Kashiwazaki-Kariwa Nuclear Power Station, TEPCO	Commissioner Ban
5	October 28-29, 2021	On-site inspection	Fukushima Daiichi Nuclear Power Station, TEPCO	Commissioner Tanaka & Commissioner Ban
6	November 1, 2021	On-site inspection.	Japan Chemical Analysis Center	Commissioner Ban

7	November 18-19, 2021	On-site investigation	Shika Nuclear Power Station, Hokuriku Electric Power Co., Inc.	Commissioner Ishiwatari
8	November 19, 2021	On-site inspection	Institute for Integrated Radiation and Nuclear Science, Kyoto University	Commissioner Yamanaka
9	December 2, 2021	On-site inspection	Fukushima Daiichi Nuclear Power Station, TEPCO	Chairman Fuketa
10	January 25, 2022	On-site investigation	Kashiwazaki-Kariwa Nuclear Power Station, TEPCO	Commissioner Yamanaka
11	March 17, 2022	On-site investigation	Fukushima Daiichi Nuclear Power Station, TEPCO	Commissioner Yamanaka

12. Meetings and Opinion Exchange with Local Parties

(1) Meetings with Local Parties

Dates	Meeting with	NRA representative
April 5, 2021	Governor of Niigata Prefecture	Secretary-General
May 21, 2021	Executive head of the municipal study group on nuclear safety measures	Deputy Secretary-General
June 14, 2021	Governor of Ehime Prefecture	Secretary-General
June 24, 2021	Governor of Shimane Prefecture (Chairperson of the Special Committee for Measures for Nuclear Power Generation of National Governors' Association, Chairperson of the Council for Nuclear Power Related Organizations)	Secretary-General
November 18, 2021	Chairperson of the prefectural assembly related to nuclear power generation, and chairperson of the council	Secretary-General
November 26, 2021	Governor of Shimane Prefecture	Secretary-General
February 17, 2022	Mayor of Matsue City	Deputy Secretary-General

(2) Exchange of Opinions between Local Stakeholders and Committee Members

NRA Chairman Fuketa and Commissioner Ban were scheduled to exchange opinions with local officials in Saga Prefecture and visit the Genkai NPS of Kyushu Electric Power Co., Inc. in June 2021, but it was postponed as part of countermeasures for the COVID-19 pandemic

(3) Results of On-site Exchange of Opinions between Local Stakeholders and NRA Officials

Dates	Venue	Name of meeting/session	Main attendees
August 6, 2021	Hokkaido	Opinion exchange on nuclear regulatory inspections, etc.	Mayor of Iwanai Town, etc.
August 11, 2021	Hokkaido	Opinion exchange on nuclear regulatory inspections, etc.	Mayor of Kamoenai Village, Tomari Village, Kyowa Town, etc.
September 7, 2021	Hokkaido	Opinion exchange on fire protection	Iwanai and Suttsu District Firefighting Unions and Chief of Fire Department Tomari Branch, etc.

November 18, 2021	Hokkaido	Briefing on the nuclear regulatory inspection results	Planning Promotion division staff of Kamoenai Village Office and Tomari Village Office, Crisis Management division staff of Iwanai Town Office, and Planning Promotion division of Kyowa Town Office
February 17, 2022	Hokkaido	Briefing on the nuclear regulatory inspection results	Planning Promotion division staff of Kamoenai Village Office and Tomari Village Office, Crisis Management division staff of Iwanai Town Office, and Planning Promotion division staff of Kyowa Town Office
May 13, 2021	Aomori Prefecture	Consultation on FY2021 Prefectural Nuclear Emergency Preparedness Drills Policy	Local governments
May 18, 2021- March 31, 2022 (16 times in total)	Aomori Prefecture	Explanation and opinion exchange regarding the nuclear regulation inspection results	Aomori Prefectural Press Association, Prefectural government, Higashidori Village, Rokkasho Village
July 27, 2021 January 11, 2022	Aomori Prefecture	Aomori Prefecture, Meeting of Municipal Persons in Charge of Nuclear Disaster Prevention	Local governments
July 29, 2021	Aomori Prefecture	2021 Prefectural Nuclear Emergency Preparedness Drills Coordination Conference	Local governments, concerned institutions
September 3, 2021	Aomori Prefecture	Opinion exchange meeting on nuclear regulatory inspections, etc.	Rokkasho Village
November 1, 2021, November 10, 2021	Aomori Prefecture	Aomori Prefecture Nuclear Disaster Prevention Drill (field training)	Heads of local governments, local governments, concerned institutions, operators
November 1-26, 2021 (5 times in total)	Aomori Prefecture	Opinion exchange meetings on nuclear power in Aomori Prefecture (Hiranai Town, Hirakawa City, Tsuruta Town, Rokunohe Town, Tohoku Town)	Local residents, etc.
December 1, 2021	Aomori Prefecture	Opinion exchange on environmental radiation monitoring, etc.	Aomori Prefecture Nuclear Energy Center
December 8, 2021	Aomori Prefecture	Aomori Prefecture Nuclear Policy Committee	organization representatives, experts, Local residents, etc.
April 19, 2021 - March 10, 2022 (6 times in total)	Miyagi Prefecture	Miyagi Prefecture nuclear emergency reinforcing working group meeting	Local governments
April 19, 2021 - March 10, 2022 (3 times in total)	Miyagi Prefecture	Miyagi Prefecture nuclear emergency drill working group meeting	Local governments

May 13 - November 12, 2021 (3 times in total)	Miyagi Prefecture	Environmental Research and Measurement Technology Group for Onagawa NPS	Local governments, operator
May 24, 2021	Miyagi Prefecture	Nuclear energy administration section managers meeting	Local governments
May 27, 2021 - March 1, 2022 (4 times in total)	Miyagi Prefecture	Explanation and opinion exchange regarding the nuclear regulation inspection results	Local governments
June 8, 2021 - February 18, 2022 (3 times in total)	Miyagi Prefecture	Environmental Conservation Monitoring Council for Onagawa NPS	Local governments, operator
June 10, 2021	Miyagi Prefecture	FY2021 Miyagi Prefecture "Disaster Prevention Day" comprehensive emergency drill (initial response drill)	Local governments, etc.
October 15, 2021 - December 14, 2021	Miyagi Prefecture	General meeting for drills	Local governments, etc.
January 25, 2022 - February 4, 2022	Miyagi Prefecture	Miyagi Prefecture Training Core Member Meeting	Local governments, etc.
June 10, 2021 - March 8, 2022 (5 times in total)	Fukushima Prefecture	Fukushima Prefecture Environmental Monitoring Evaluation Subcommittee	Local governments, experts
June 14, 2021 - February 7, 2022 (3 times in total)	Fukushima Prefecture	Fukushima Prefecture Labor Safety and Health Subcommittee	Local governments, experts
May 25, 2021 - March 25, 2022 (4 times in total)	Fukushima Prefecture	Fukushima Prefecture Decommissioning Safety Monitoring Council	Local governments, experts
July 28, 2021 - March 24, 2022 (4 times in total)	Fukushima Prefecture	Prefectural Council for Ensuring the Safety of Reactor Decommissioning	Residents, representatives of organizations, etc.
August 17, 2021 - January 18, 2022 (2 times in total)	Fukushima Prefecture	Naraha Nuclear Facility Monitoring Committee	Experts
April 14, 2021 - January 12, 2022 (9 times in total)	Niigata Prefecture	Regional Panel for Ensuring Transparency of Kashiwazaki-Kariwa NPS	Experts, local governments, operator
April 23, 2021 - February 7, 2022 (8 times in total)	Niigata Prefecture	Municipal Study Group on Nuclear Safety Measures	Experts, local governments, operator
May 25, 2021 - February 16, 2022 (5 times in total)	Niigata Prefecture	Liaison meeting on technology for the environmental radiation monitoring of the NPP surrounding area in Niigata Prefecture	Local governments, operator
September 6, 2021, March 29, 2022	Niigata Prefecture	Regular meeting for monitoring and assessing the environment of the NPP surrounding area in Niigata Prefecture	Heads of local governments, local governments, academic experts, concerned organizations and operator

July 29, 2021 - February 28, 2022 (2 times in total, including a meeting in writing)	Niigata Prefecture	Kashiwazaki City disaster prevention conference	Heads of local governments, experts
April 9, 2021	Niigata Prefecture	Explanation on conformity of Kashiwazaki-Kariwa NPS to regulations	Niigata Prefectural Assembly members
April 15, 2021	Niigata Prefecture	Response to requests related to physical protection incidents	Niigata Liberal Democratic Party Prefectural Assembly members
February 21, 2022 (meeting in writing)	Niigata Prefecture	Fire Prevention Liaison Committee	Local governments, public fire department, operator
June 17, 2021	Niigata Prefecture	Lecture at Nagaoka University of Science and Technology	Professors, students
May 19, 2021 - February 10, 2022 (4 times in total)	Niigata Prefecture	Explanation regarding the nuclear regulation inspection results	Local government staff (Niigata Prefecture, Kashiwazaki City, Kariwa Village)
February 18, 2022	Niigata Prefecture	Requests by citizens' groups	Assembly to deliver voices of citizens to the technical committees
May 19, 2021 - February 17, 2022 (4 times in total)	Ibaraki Prefecture	Explanation and opinion exchange regarding the nuclear regulation inspection results	Prefectural government, related municipalities
July 26, 2021 - March 28, 2022 (4 times in total, including meetings in writing)	Ibaraki Prefecture	Advisory committee for the Ibaraki Prefecture Environmental Radiation Monitoring Committee	Prefectural government, related municipalities and residents
February 2, 2022 March 7, 2022	Ibaraki Prefecture	Preliminary meetings on home evacuation - evacuation guidance drills (Tokai Village)	Tokai Village
March 4, 2022	Ibaraki Prefecture	Tokai Area Liaison Conference (4th)	Japan Air Self-Defense Force Japan Atomic Power Co.
January 18, 2022	Kanagawa Prefecture	Kawasaki Nuclear Facility Safety Committee (Secretariat meeting)	Local governments, operator
February 8, 2022	Kanagawa Prefecture	Kawasaki Nuclear Facility Safety Committee (plenary meeting)	Local governments, operator
April 12, 2021	Kanagawa Prefecture	Opinion exchange meeting on fire drills with Yokosuka Minami Fire Station	Chief of Minami Fire Station, etc.

April 27, 2021	Kanagawa Prefecture	Information exchange meeting on fire prevention with Yokosuka Minami Fire Station	Vice Chief of Minami Fire Station, etc.
May 18, 2021 - February 18, 2022 (4 times in total)	Kanagawa Prefecture	Explanation and opinion exchange regarding the nuclear regulation inspection results	Staff of Kanagawa Prefecture Crisis Management Division
May 18, 2021 - February 18, 2022 (4 times in total)	Kanagawa Prefecture	Explanation and opinion exchange regarding the nuclear regulation inspection results	Manager of Yokosuka City Crisis Management Division, etc.
June 22, 2021	Shizuoka Prefecture	Omaezaki City Special Committee on Nuclear Countermeasures	Members of municipal assemblies, etc.
July 8, 2021 - March 22, 2022 (4 times in total)	Ishikawa Prefecture	Ishikawa Prefecture Nuclear Environmental Safety Control Council	Deputy governor of Ishikawa Prefecture, chairperson, experts, relevant local governments, etc.
April 16 and October 2, 2021 (2 times in total)	Ishikawa Prefecture	Shika Nuclear Power Station Safety Promotion Committee	Mayor of Shika Town, chairpersons, representatives of residents, etc.
April 16, 2021 - January 28, 2022 (3 times in total)	Ishikawa Prefecture	Joint Meeting of Akasumi Area Committee and Safety Promotion Liaison Committee	Mayor of Shika Town, chairpersons of wards, representatives of residents, etc.
May 21, 2021 - February 16, 2022 (4 times in total)	Ishikawa Prefecture	Explanation regarding the nuclear regulation inspection results	Ishikawa Prefectural Government staff
May 19, 2021 - February 16, 2022 (4 times in total)	Ishikawa Prefecture	Explanation regarding the nuclear regulation inspection results	Shika Town Government staff
April 9 - November 12, 2021 (2 times in total)	Fukui Prefecture	Nuclear Safety Expert Council	Experts
April 19, 2021	Fukui Prefecture	Plenary meeting of prefectural assembly	Prefectural assembly members
May 14, 2021 (web meeting)	Gifu Prefecture	Explanation on nuclear regulations, etc. to the Gifu Prefectural Nuclear Power Division	Gifu Prefectural Government staff
May 19, 2021 - February 16, 2022 (4 times in total)	Fukui Prefecture	Fukui Prefecture NPP liaison meeting	Fukui Prefectural Government and municipality staff
July 16, 2021 - March 25, 2022 (4 times in total)	Fukui Prefecture	Fukui Prefecture Nuclear Environmental Safety Control Council	Members of the Prefectural Assembly, Heads of local governments, representatives of organizations, etc.

July 26, 2021 (web meeting)	Gifu Prefecture	Gifu Prefecture Nuclear Emergency Management Study Group	Gifu Prefectural Government and municipality staff
August 23, 2021	Fukui Prefecture	Response to request for explanation	Directors in charge of Fukui Prefecture
August 23, 2021	Fukui Prefecture	Response to request for explanation	Deputy Mayor of Tsuruga City, etc.
November 24, 2021	Fukui Prefecture	Nuclear emergency preparedness basic training workshop	Fukui Prefecture Police Station staff
December 22, 2021	Fukui Prefecture	Shiga Prefecture Nuclear Safety Measures Liaison Council	Shiga Prefectural Government and municipality staff
March 23, 2022	Fukui Prefecture	Wakasa Nuclear Power Station Environmental Safety Council	Mayor of Town, town council members, representatives of organizations, residents, etc.
March 29, 2022	Fukui Prefecture	Obama Nuclear Power Station Environmental Safety Council	Mayor, city council members, representatives of organizations
June 8, 2021	Osaka Prefecture	Explanation regarding the nuclear regulation inspection results	Kumatori Town staff
June 8, 2021	Osaka Prefecture	Explanation regarding the nuclear regulation inspection results	Izumisano City staff
June 10, 2021	Osaka Prefecture	Explanation regarding the nuclear regulation inspection results	Osaka Prefectural Government staff
June 10, 2021	Osaka Prefecture	Explanation regarding the nuclear regulation inspection results	Higashiosaka City staff
July 26, 2021	Osaka Prefecture	Nuclear facilities liaison conference	Higashiosaka City staff, Higashiosaka fire department, business operators
July 27, 2021	Osaka Prefecture	Nuclear Problems Countermeasures Council	Mayor of Kumatori Town, Kumatori Town Council members and experts
July 28, 2021	Osaka Prefecture	Nuclear Problems Countermeasures Council	Mayor of Izumisano City, Izumisano City Council members and experts
October 18, 2021	Osaka Prefecture	Explanation regarding the nuclear regulation inspection results	Kumatori Town staff

October 21, 2021	Osaka Prefecture	Explanation regarding the nuclear regulation inspection results	Osaka Prefectural Government staff
October 21, 2021	Osaka Prefecture	Explanation regarding the nuclear regulation inspection results	Higahsiosaka City staff
October 28, 2021	Osaka Prefecture	Explanation regarding the nuclear regulation inspection results	Izumisano City staff
December 15 - 17, 2021	Osaka Prefecture	Exchange with local fire departments	Senshu-Minami Firefighting Unions, executive officials, etc. of Senshu-Minami Wide Area Fire Department Headquarters
March 8, 2022	Osaka Prefecture	Explanation regarding the nuclear regulation inspection results	Osaka Prefectural Government staff
March 8, 2022	Osaka Prefecture	Explanation regarding the nuclear regulation inspection results	Higashiosaka City staff
March 9, 2022	Osaka Prefecture	Explanation regarding the nuclear regulation inspection results	Kumatori Town staff
June 4, 2021 (web meeting)	Okayama Prefecture	Opinion exchange on alternative OFC	Cabinet Office Okayama Prefectural Office
June 15, 2021 - March 10, 2022 (4 times in total) (web meeting)	Okayama Prefecture	Explanation regarding the nuclear regulation inspection results	Okayama Prefectural Office Kagamino Town Tottori Prefecture Misasa Town
August 2, 2021	Okayama Prefecture	Okayama Prefecture Monitoring Council (Explanation of report on environmental radiation measurement results, etc.)	Okayama Prefectural Office Kagamino Town
October 19, 2021 - March 9, 2022 (3 times in total)	Okayama Prefecture	Kagamino Town Regional Disaster Prevention Planning Committee	Okayama Prefectural Office Kagamino Town
October 7, 2021	Okayama Prefecture	Preliminary meeting for the Okayama Prefecture nuclear emergency preparedness drills	Okayama Prefectural Office Tsuyama Area Firefighting Union
May 19, 2021 - February 16, 2022 (4 times in total)	Shimane Prefecture	Explanation regarding the nuclear regulation inspection results	Local government staff (Shimane Prefecture, Matsue City, Unnan City, Yasugi City, Tottori Prefecture, Sakaiminato City, Yonago City)
September 2, 2021 - March 30, 2022 (3 times in total)	Ehime Prefecture	Ikata Nuclear Power Station Environmental Safety Control Committee	Heads of local governments, local governments, experts

August 5, 2021 October 12, 2021 (2 times in total)	Ehime Prefecture	Ikata Nuclear Power Station Environment and Safety Management Committee, Expert Subcommittee on Nuclear Energy Safety	Experts
October 8, 2021 - March 30, 2022 (2 times in total)	Ehime Prefecture	Ikata Nuclear Power Station Environment and Safety Management Committee, Environmental Expert Subcommittee	Experts
September 9 and October 26, 2021 (2 times in total)	Ehime Prefecture	Ikata Environmental Monitoring Committee	Heads of local governments, City council members, representatives of residents
October 26, 2021	Ehime Prefecture	Ikata Town Special committee meeting on NPP-related measures	Town council members
April 19, 2021 - January 26, 2022 (4 times in total)	Saga Prefecture	Explanation regarding the nuclear regulation inspection results	Local governments
August 4, 2021, January 26, 2022 (2 times in total)	Saga Prefecture	Saga Prefecture Nuclear Environmental Safety Liaison Committee	Heads of local governments, representatives of residents, etc.
May 31, 2021 - February 8, 2022 (4 times in total)	Saga Prefecture	Saga Environment Radioactivity Technology meeting	Experts, etc.
July 16, 2021 - March 25, 2022 (4 times in total including web meetings)	Kagoshima Prefecture	Kagoshima Radiation Monitoring Technology Committee meeting	Local governments, operators, experts, etc.
July 13, 2021	Kagoshima Prefecture	Kagoshima Prefecture Ocean Monitoring Technology Committee meeting	Local governments, operators, experts, etc.
May 25, 2021 - February 16, 2022 (4 times in total including meetings in writing)	Kagoshima Prefecture	Satsuma Sendai City Nuclear Safety Measures Liaison Council	Heads of local governments, Members of Municipal Assemblies, representatives of residents, etc.
April 13, 2021 - January 21, 2022 (4 times in total including web meetings)	Kagoshima Prefecture	Nuclear power generation-related cities manager meeting	Local governments, prefectural organizations, operator
August 20, 2021 - February 4, 2022 (2 times in total, web meeting)	Kagoshima Prefecture	Nuclear Safety Measures Liaison Council	Heads of local governments, assembly members, operator, etc.

* In addition to those stated in the table, meetings of working groups of local nuclear preparedness councils and committees on radiation oversight or monitoring are occasionally held in related prefectures, and the personnel of the NRA Secretariat attend.

(4) Major Explanations on Results of Review of Nuclear Facilities

Dates	Venue	Name of meeting/session	Contents
May 25, 2021	Fukushima Prefecture	Fukushima Prefecture Decommissioning Safety Oversight Council	Fukushima Daini NPS (approval of decommissioning plan)
July 9, 2021	Saga Prefecture	Saga Prefectural Nuclear Safety Subcommittee	Genkai NPS (approval of basic design of spent fuel dry-type storage facility)
August 19, 2021	Niigata Prefecture	Study Group on Nuclear Safety Measures by Municipalities - Training of personnel in charge of nuclear safety measures	Kashiwazaki-Kariwa NPS Unit 7 (conformity to new regulatory requirements)
August 23, 2021	Fukui Prefecture	Explanation to the Deputy Mayor of Tsuruga City	Suspension of review of Tsuruga PS Unit 2
September 9, 2021	Fukushima Prefecture	Decommissioning Safety Oversight Council	High-concentration contamination of the shield plug in one of interim reports on the investigation and analysis of 1F accident
October 5, 2021	Shimane Prefecture	Explanation to Mayor and Deputy Mayor of Matsue City, Matsue City Council	Shimane NPS Unit 2 (conformity to new regulatory requirements)
October 6, 2021	Shimane Prefecture	Explanation to Mayor of Shimane Prefecture, Shimane Prefectural Assembly	Shimane NPS Unit 2 (conformity to new regulatory requirements)
October 7, 2021	Shimane Prefecture	Shimane Prefectural NPS Vicinity Environmental Safety Council	Shimane NPS Unit 2 (conformity to new regulatory requirements)
October 8, 2021	Tottori Prefecture	Tottori Prefectural Assembly	Shimane NPS Unit 2 (conformity to new regulatory requirements)
October 11, 2021	Shimane Prefecture	Unnan City Nuclear Power Plant Environmental Safety Council	Shimane NPS Unit 2 (conformity to new regulatory requirements)
October 12, 2021	Shimane Prefecture	Shimane Prefecture Nuclear Safety Advisory Council, Izumo City Council	Shimane NPS Unit 2 (conformity to new regulatory requirements)
October 15, 2021	Shimane Prefecture	Matsue City Nuclear Power Plant Environmental Safety Council	Shimane NPS Unit 2 (conformity to new regulatory requirements)
October 22, 2021	Shimane Prefecture, etc.	Section Manager Meeting of the Council of Nuclear Power Generation Related Organizations Section Manager Meeting	Explanation and opinion exchange regarding the budget request for FY2022 national budget
October 23, 2021	Shimane Prefecture	Explanation to Matsue City residents	Shimane NPS Unit 2 (conformity to new regulatory requirements)
October 24, 2021	Shimane and Tottori Prefecture	Explanation to residents of Izumo City of Shimane Prefecture and Yonago City of Tottori Prefecture	Shimane NPS Unit 2 (conformity to new regulatory requirements)
October 29, 2021	Shimane Prefecture	Explanation to Matsue City residents	Shimane NPS Unit 2 (conformity to new regulatory requirements)
October 30, 2021	Shimane and Tottori Prefecture	Explanation to residents of Matsue City of Shimane Prefecture and Sakaiminato City of Tottori Prefecture	Shimane NPS Unit 2 (conformity to new regulatory requirements)

October 31, 2021	Shimane Prefecture	Explanation to Unnan City residents	Shimane NPS Unit 2 (conformity to new regulatory requirements)
November 1, 2021	Aomori Prefecture	Opinion exchange meeting on nuclear power	Explanation and opinion exchange regarding safety regulations for nuclear facilities
November 6, 2021	Shimane Prefecture	Explanation to Yasugi City residents	Shimane NPS Unit 2 (conformity to new regulatory requirements)
November 7, 2021	Shimane Prefecture	Explanation to Matsue City residents	Shimane NPS Unit 2 (conformity to new regulatory requirements)
November 8, 2021	Tottori Prefecture	Nuclear Safety Advisory Council, Tottori Prefecture Nuclear Safety Measures Joint Meeting	Shimane NPS Unit 2 (conformity to new regulatory requirements)
November 9, 2021	Aomori Prefecture	Opinion exchange meeting on nuclear power	Explanation and opinion exchange regarding safety regulations for nuclear facilities
November 10, 2021	Niigata Prefecture	Association Communities for Ensuring Transparency of Kashiwazaki-Kariwa NPS - information sharing meeting	Information sharing meeting by Kashiwazaki-Kariwa “Association of Communities” on PP cases and replies to questions by the commissioners of the Association
November 10, 2021	Aomori Prefecture	Opinion exchange meeting on nuclear power	Explanation and opinion exchange regarding safety regulations for nuclear facilities
November 11, 2021	Tottori Prefecture	Yonago City Council	Shimane NPS Unit 2 (conformity to new regulatory requirements)
November 12, 2021	Tottori Prefecture	Sakaimanato City Council	Shimane NPS Unit 2 (conformity to new regulatory requirements)
November 24, 2021	Tottori Prefecture	Explanation to Yonago City residents	Shimane NPS Unit 2 (conformity to new regulatory requirements)
November 25, 2021	Aomori Prefecture	Opinion exchange meeting on nuclear power	Explanation and opinion exchange regarding safety regulations for nuclear facilities
November 26, 2021	Aomori Prefecture	Opinion exchange meeting on nuclear power	Explanation and opinion exchange regarding safety regulations for nuclear facilities
December 8, 2021	Aomori Prefecture	Nuclear Policy Forum	Replies to preliminary questions on the status of review on conformity of nuclear facilities in the prefecture to new regulatory requirements
December 22, 2021	Shiga Prefecture	Nuclear Safety Measures Liaison Council	Mihama PS Unit 3 and Takahama PS Units 1 and 2 (conformity to new regulatory requirements, extension of operating period)
December 23, 2021	Kagoshima Prefecture	Kagoshima Prefecture Nuclear Safety - Special Committee on Disaster Prevention including Evacuation Planning, etc.	Implementation of standard response spectrum
January 12, 2022	Niigata Prefecture	Association of Communities for Ensuring Transparency of Kashiwazaki-Kariwa NPS	Status of supplemental inspections at Kashiwazaki-Kariwa NPS Units 6 and 7

January 20, 2022	Kagoshima Prefecture	Subcommittee on Verification of Operating Period Extension at Sendai NPS	Operating period extension approval system
February 7, 2022	Niigata Prefecture	Study Group on Nuclear Safety Measures - Meeting of personnel in charge of nuclear safety measures	Current Status of nuclear regulations concerning Kashiwazaki-Kariwa NPS
March 24, 2022	Fukushima Prefecture	Prefectural Residents Meeting for ensuring safety in decommissioning of nuclear power stations in Fukushima Prefecture	Progress of efforts for ALPS-treated water and decommissioning
March 29, 2022	Fukui Prefecture	Obama City Nuclear Power Environment Safety Council	Ohi PS Unit 3 (permission of change in operational safety programs: Technical assessment of aging management, etc.)

13. Record of Opinion Exchange with Foreign Experts, etc.

(1) Opinion Exchange with Foreign Experts

Dates	Attendees	Attendance of Commissioners
2022 (opinion exchange in writing)	Richard A. Meserve, External Advisor Dana Drábová, External Advisor Andy Hall, External Advisor Philippe Jamet, External Advisor	Chairman Fuketa Commissioner Tanaka Commissioner Yamanaka Commissioner Ban Commissioner Ishiwatari

(2) Opinion Exchange with Foreign Regulatory Authorities

Dates	Participant	Attendance of Commissioners in charge
May 10, 2021	International Nuclear Regulators Association (INRA) (nuclear regulators from the United States, United Kingdom, France, Germany, Canada, Spain, Sweden, and South Korea)	Chairman Fuketa
June 2, 2021	Chairman Hanson of US Nuclear Regulatory Commission (NRC)	Chairman Fuketa
September 20, 2021	Director-General Kenzelmann of Swiss Federal Nuclear Safety Inspectorate (ENSI)	Chairman Fuketa
September 20, 2021	Rumina Velshi, President of Canadian Nuclear Safety Commission (CNSC)	Chairman Fuketa
September 20, 2021	Chairman Doroszczuk of France Nuclear Safety Authority (ASN)	Chairman Fuketa
September 21, 2021	International Nuclear Regulators Association (INRA) (nuclear regulators from the United States, United Kingdom, France, Germany, Canada, Spain, Sweden, and South Korea)	Chairman Fuketa

14. Continuous Improvement of Management

(1) Internal Audit of Management System

In FY2021, internal audits were conducted in the following six divisions:

- Reactor Technology Training Division, NRA Human Resource Development Center
- Onagawa NRA Regional Office
- Division of Licensing for Earthquake and Tsunami Measures
- Yokosuka Nuclear Vessel Monitoring Center
- Division of Specified Oversight
- Nuclear Fuel Facilities Review Division

Theme audits were conducted for the Division of Licensing for Earthquake and Tsunami Measures and Nuclear Fuel Facilities Review Division as the "the status of activities under COVID-19 pandemic."

Overall, no items required improvement, with one item classified as desirable for improvement and eight good practices.

The outline of internal audits is explained below by division. It can be evaluated that the management system is generally functioning effectively through activities such as confirming the status of compliance with operation manuals (peer review), creation and carrying of unique cards emphasizing safety attitude and work efficiency improvement through efforts such as avoiding going to office as a countermeasure for COVID-19.

1. Reactor Technology Training Division, NRA Human Resource Development Center

(1) Date of audit: July 14, 2021

(2) Result of audit: Items requiring improvement and items desirable for improvement: 0; good practice: 1

(3) Description of good practices: Activities of the Management System Promotion Team

The presence of a Management System Promotion Team was confirmed in the NRA Human Resource Development Center (hereinafter referred to as the "Center"). The management promotion team, that started its activities in FY2015, decides what to be implemented every fiscal year and confirms the compliance status of individual departments in the Center with the operation manual (peer review).

At the peer review of the Regulatory Training Division held in March, the PDCA cycle was improved through interviews about measures to prevent serious mistakes such as those in past national examinations.

Cross-sectional improvement on a division level such as the above case is considered good practice.

(4) Others (Items Confirmed as Special Notes (4 Items))

(a) Improvement of training evaluation method

(b) Regular study sessions for knowledge transfer

(c) Appropriate distribution of information equipment

(d) Appropriate staff placement, including clerical assistants

2. Onagawa NRA Regional Office

(1) Date of audit: July 29 and 30, 2021

(2) Result of audit: Items requiring improvement and items desirable for improvement: 0; good practice: 0

(3) Others (Items confirmed as special notes (5 items))

(a) Activities to cope with future increase in inspection work

(b) Supplementary explanation to interpret the inspection guide

(c) Inspections based on the system design philosophy for new inspection systems

(d) Aging of inspectors and transfer of knowledge and experience

(e) Inspections related to physical protection

3. Division of Licensing for Earthquake and Tsunami Measures (Theme Audits)

(1) Date of audit: August 19, 2021

(2) Result of audit: Items requiring improvement and items desirable for improvement: 0; good practice: 1

(3) Description of good practices: Efforts to avoid going to office under countermeasure for the COVID-19 pandemic

In the Division of Licensing for Earthquake and Tsunami Measures, efforts have been made to increase the rate of working from home and avoid coming to office by conducting its main work, holding review meetings and work arrangements, on a fixed day of the week as countermeasures for the COVID-19 pandemic.

Specifically, matters that need to be fixed through discussions, such as sharing awareness within and between review teams and decision of specific review policy, are discussed intensively on Mondays and Tuesdays to facilitate teleworking on Wednesdays and Thursdays.

Such an approach to avoid going to work is considered good practice that should be disseminated throughout the agency as examples contributing to operational efficiency.

(4) Others (Items confirmed as special notes (4 items))

(a) Efficiency of work by the two-team system

(b) Work requiring attendance

(c) Communication within the department when working from home

(d) Online meetings with operators

4. Yokosuka Nuclear Vessel Monitoring Center

(1) Date of audit: November 2, 2021

(2) Result of audit: Items requiring improvement: 0, items desirable for improvement: 1, and good practice: 0

(3) Details of items desirable for improvement:

U.S. nuclear vessels call at Yokosuka Port for 270 days a year on average (survey days averaged 249 days) and in years with many port calls, the total number of port call days exceeds 300 a year. Since the US military will notify us of port call information 24 hours in advance, the work usually occurs suddenly when the vessel is in port regardless of Saturdays and Sundays. Accordingly, survey team leaders (technical advisors) are often forced to work on Saturdays and Sundays. It is fairly difficult to inspect the radioactivity of a nuclear vessel and maintain radioactivity research facilities when only the Director-General of the Center and team leaders (technical advisors) are involved

while personnel coordination is also difficult. Some measures such as the appointment of a deputy director-general are required.

(4) Others (Items Confirmed as Special Notes (5 Items))

(a) High safety awareness

(b) Collaboration with U.S. forces in Japan and local governments

(c) Preparation of a detailed monitoring manual

(d) Establishment of an emergency response system

(e) “On site” actions

5. Division of Specified Oversight

(1) Date of audit: December 8 and 9, 2021

(2) Result of audit: Items requiring improvement, items desirable for improvement: 0, and good practice: 2

(3) Description of good practices:

(a) Creation and carrying of a card focusing on “3S Policy” and “Inspector Attitude”

In the Division of Specified Oversight, a card describing the “policy of 3S” and “inspector's mindset” unique to the division is created and carried by the staff members.

The NRA itself distributes a declaration card reflecting organizational philosophy and safety culture, but preparing a card emphasizing safety attitude for specific work of the division and carrying it around is unprecedented. Such an approach is a very good example of activities for fostering and maintaining safety culture.

(b) Monthly notification of items requiring improvement within departments

A group overseeing quality control inspections in the specialized inspection department extracts information useful to benchmark operations from items requiring improvement in the Secretariat of the NRA (posted to the web portal by the Management System Office), which it disseminates by email within the department every month. The Director-General for Management also calls attention to it at intra-section meetings.

It is a good practice to know items requiring improvement in other departments and focus on avoiding any recurrence.

(4) Others (Items Confirmed as Special Notes (3 Items))

(a) Holding of regular meetings

(b) Preparation and utilization of manuals and check sheets

(c) Shortage of inspectors

6. Nuclear Fuel Facilities Review Division (Theme Audits)

(1) Date of audit: December 15, 2021

(2) Result of audit: Items requiring improvement, items desirable for improvement: 0, and good practice: 4

(3) Description of good practices:

Even before implementing COVID-19 countermeasures, the Nuclear Fuel Facilities Review Division has striven to manage and organize documents more efficiently and with an increase in teleworking, further promoted operational improvement by devising and considering how to achieve the target number of days of coming to office without reducing operational efficiency and ensuring that work can be carried out comfortably, even when teleworking.

The following are recognized as good practices that should be widely disseminated in the agency:

(a) Detailed work reports and progress management during teleworking

In the Nuclear Fuel Facilities Review Division, the team member working from home sends e- mail at the start and end of teleworking to the team leader such as the Director for Nuclear Regulation, Deputy Management Director, or Senior Coordinator for Policy Planning who, upon receiving email from a subordinate, immediately sends a confirmation email or makes a phone call in an attempt to determine whether there are any concerns or problems.

Concentration raises efficiency in some facility review work, such as the confirmation of documents and in this sense, teleworking is more suitable for this type of work than others in the division. According to this idea, division-wide efforts have been made to reduce the attendance rate to achieve the target value.

(b) Preparation and utilization of a procedure manual and email templates, etc.

In the Nuclear Fuel Facilities Review Division, four young team members from each line of team take turns to come to the office to receive documents from operators. A simple work manual is provided to enable multiple members to perform uniform work without omissions. The manual also comes with various email templates to ensure quick and accurate work from receipt of documents to their distribution to relevant departments and posting on the website to improve and streamline work.

(c) Organizing the work environment

As a result of step (b), documents can be posted on the website the day after they are received at the latest and even members without a USB thin client system can refer to most of the required documents from the website when working from home.

In addition, data search has been enhanced by deleting unnecessary data on the shared drive and organizing data storage rules and since the work can be done paperlessly, there is almost no paper on desks in offices. This has also had the effect of preventing diffusion and leakage of sensitive information when fewer people are working in offices due to the promotion of teleworking.

(d) Alleviation of psychological burden by increasing opportunities for communication

Teleworking allows workers to concentrate on their work, but it also makes it difficult for them to interact with others, which highlights the issue of mental health of workers, particularly for those who live alone.

With the mental health of team members in mind, the Nuclear Fuel Facilities Review Division set a day for all team members to come to work and switched meetings from online to face-to-face. In addition to meetings for reports and consultations, meetings to exchange views are also held to discuss topics such as commission agendas and past job assignments of individual members to help increase awareness of work and transfer knowledge.

The Director for Nuclear Regulation gives themes such as the basic attitude for response to operators or review to young and mid-career members about once every two weeks with the intention of increasing communication with individual members through their reports.

(2) List of Items Requiring Improvement Confirmed in FY2021

	Day of confirmation	Item Requiring Improvement
1	May 13, 2021	Clerical errors in NRA report material
2	May 20, 2021	Delay in submission of documents on negotiation with the National Personnel Authority
3	June 1, 2021	Temporarily mislaying a USB flash drive
4	June 10, 2021	Inadequate procedure for transferring the Special Account for Reconstruction from the Great East Japan Earthquake
5	June 11, 2021	Failure to post the notification on the results of nuclear regulatory inspections to the website
6	June 25, 2021	Failure to create the Confidential Document Management Ledger for FY2020
7	June 28, 2021	Occurrence of unprocessed settlement procedure for withdrawal of application and erroneous disposal of the application form
8	July 5, 2021	Revisions of accounting provisions at the Institute for Atomic Energy of Rikkyo University
9	July 9, 2021	Delay in the enactment of internal regulations related to the handling of applications for which a letter of withdrawal had been submitted
10	July 21, 2021	Clerical error in the type certification notice already issued for the design of specific containers, etc. for spent fuel storage facilities
11	July 27, 2021	Omission of approval for the designation of confidential documents
12	August 31, 2021	Omission of designation as confidential documents for those related to special facilities for severe accident management
13	August 31, 2021	Inappropriate storage of documents related to physical security of specified nuclear fuel materials
14	September 1, 2021	Disclosure of non-disclosure information on the NRA website
15	September 30, 2021	Delay in sending a copy of notification for permission to change in basic design
16	November 5, 2021	Omission of administrative procedure for the loss or expiration of inspector identification card, etc. carried in nuclear regulatory inspections
17	November 24, 2021	Inconsistency in analytical specifications for Sr-90 in the marine soil off Fukushima
18	December 6, 2021	Omission of procedure for thorium storage at the Kyoto University Critical Experimental Apparatus (KUCA)
19	December 20, 2021	Incorrectly dated letter of appointment in the procedure for appointing a Radiation Council member
20	January 19, 2022	Absence of the scope of personnel handling confidential documents
21	January 24, 2022	Publication of non-public information on the NRA website
22	February 1, 2022	Inadequacies in the revision of the review guide due to error in the old and new comparison table
23	February 9, 2022	Omission of the list of interviews of the NRA chairman, commissioners and NRA Secretariat executives on the NRA website
24	February 9, 2022	Incorrect payment of allowance for dependents
25	February 14, 2022	False reports on legal records of investigation related to salary payment in 2020
26	February 14, 2022	Omission of documents attached to the application for approval to change basic design of the Kyoto University Critical Experimental Apparatus (KUCA)

27	February 17, 2022	Delayed response to reports of unexpected findings by nuclear fuel materials users
28	February 17, 2022	Incomplete procedure of request for giving facilities
29	February 21, 2022	Failure to mask non-disclosed information in materials released on the NRA website

15. Record of Responses to Formal Objections in FY2021

	Formal objection	Date of determination	Contents of determination
1	Request for review of and petition for stay of execution to the permission for basic design change at Tokai Daini NPS (Japan Atomic Power Company)	July 28, 2021	Dismissed
2	Request for review of and petition for stay of execution to the approval of construction plan at Tokai Daini NPS (Japan Atomic Power Company)	July 28, 2021	Dismissed
3	Request for review of and petition for stay of execution to the approval for operation period extension for Tokai Daini NPS of Japan Atomic Power Company	July 28, 2021	Dismissed
4	Request for review of and petition for stay of execution of permission for change in operational safety programs for Tokai Daini NPS of Japan Atomic Power Company	July 28, 2021	Dismissed

Reference 2 Materials related to Implementation of Various International Treaties on Nuclear Safety (related to Section 2 in Chapter 1)

The NRA is promoting cooperation with international organizations and overseas regulatory agencies through treaties and participation in the development and reviews of the IAEA's safety standards and in joint research to continuously improve nuclear regulation in Japan and contribute to nuclear safety in the international society.

1. Implementation of Various International Treaties on Nuclear Safety

(1) Convention on Nuclear Safety (Nuclear Safety Convention)

This convention applies to nuclear power plants and intends to globally achieve and maintain a high-level of nuclear safety. It is aimed to establish and maintain radiation protection at nuclear power plants, to prevent an accident with radiological consequences, and to mitigate its consequences in the event of an accident. According to the Convention, the NRA has been implementing activities (so-called "review process") every three years such as (1) developing a national report, (2) conducting a peer review among contracting parties and (3) participating the meeting of contracting parties (review meeting).

(Past major activities under the Convention on Nuclear Safety)

Periods	Overview
August 2013	Submission of Japan's 6th National Report
March and April 2014	The 6th Review Meeting (participated by Commissioner Oshima and others)
August 2016	Submission of Japan's 7th National Report
March and April 2017	The 7th Review Meeting (participated by Commissioner Ban and others)
August 2019	Submission of Japan's 8th National Report

(2) Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (Joint Convention on Nuclear Waste)

This convention applies to the safety of the management of spent fuel and radioactive waste generated from facilities including nuclear power plants, research reactors and other nuclear facilities such as re-processing plants and rad-waste storage facilities, etc. It is aimed to achieve and maintain a high-level of safety worldwide in spent fuel and radioactive waste management, and to ensure radiation protection during all stages of spent fuel and radioactive waste management, to prevent an accident with radiological consequences and to mitigate its consequences in the event of an accident. According to the Convention, the NRA has been implementing activities (so-called "review process") every three years such as (1) preparing a national report, (2) conducting a peer review among contracting parties and (3) participating the meeting of contracting parties (review meeting).

(Past major activities under the Joint Convention on Nuclear Waste)

Periods	Overview
October 2014	Submission of Japan's 5th National Report for the 5th Review Meeting
May 2015	The 5th Review Meeting (participated by commissioner Tanaka Satoru and others)
October 2017	Submission of Japan's 6th National Report
May and June, 2018	The 6th Review Meeting (participated by commissioner Tanaka Satoru and others)
October 2020	Submission of Japan's 7th National Report

(3) Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency

The Early Notification Convention is a framework for providing "information on an accident causing a transborder radiation impact" to countries that may be affected and the IAEA, whereas the Assistance Convention is a framework for providing assistance in case of a nuclear accident or a radiological emergency.

The meetings of the competent authorities of the contracting parties under the Early Notification Convention and the Assistance Convention are held every two years. The most recent meeting of the countries was held in June 2020, in which the NRA staff participated along with the Ministry of Foreign Affairs and the Cabinet Office.

(4) The Convention on the Physical Protection of Nuclear Material, its Amendments and International Convention for the Suppression of Acts of Nuclear Terrorism (Nuclear Terrorism Suppression Convention)

The Physical Protection Convention obligates the contracting countries to take protective measures for nuclear materials during their international transportation, and requires them to protect nuclear materials against their illegal acquisition and uses. The amendment of Physical Protection Convention took effect in Japan in May 2016 and the targets of protection based on the convention were expanded to domestic peaceful uses of nuclear materials, storage and transportation, and nuclear facilities.

The Nuclear Terrorism Prevention Convention is intended to strengthen international cooperation for taking effective and feasible measures to prevent nuclear terrorism, and prosecute and punish the suspect(s) on the basis of the recognition that nuclear terrorism will lead to a serious consequence and will threaten international peace and safety. The NRA is involved in the implementation of the Convention for which Japan made ratification.

2. Cooperation under International Organizations

(1) International Atomic Energy Agency (IAEA)

The IAEA is an international organization established in 1957 under the leadership of the UN with the aim of promoting peaceful uses of nuclear energy, and consists of 173 member states, as of December 2021. Its secretariat is located in Vienna and the director-general is Rafael Mariano Grossi.

The IAEA's activities in the field of nuclear safety range widely, such as the development or review of its safety standards, activities relating to emergency arrangements, radiation protection and physical protection, and international cooperation for improving nuclear regulation.

The Commission on Safety Standards (CSS), which is a standing committee, reviews the safety standard documents. The NRA also is actively participating in the activities of CSS and its subcommittees.

Through the IAEA, NRA has been contributing internationally as an international, professional organization by joining the IAEA's standing advisory groups such as the International Nuclear Safety Advisory Group (INSAG), Advisory Groupon Nuclear Security (AdSec, of which NRA Commissioner Tanaka is a member), and others.

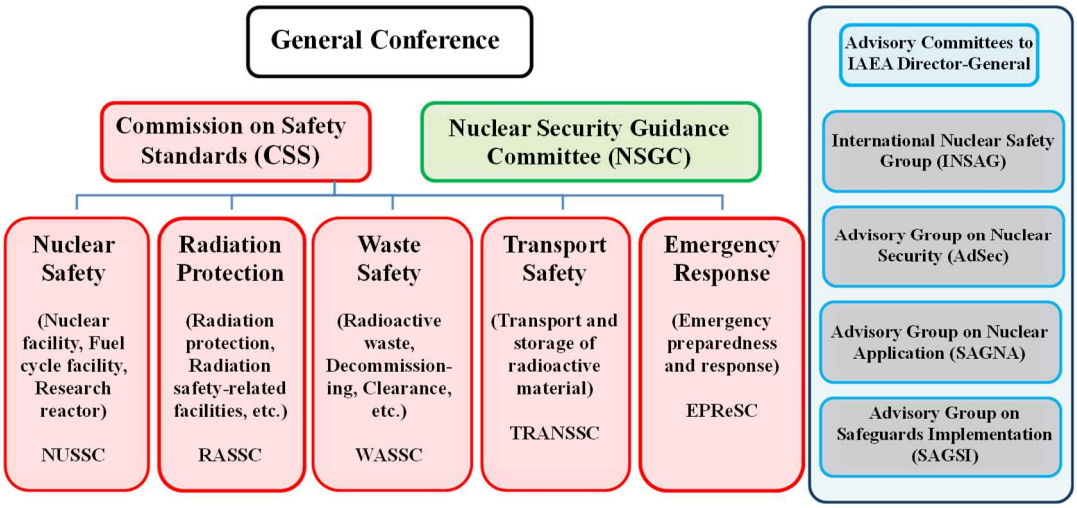


Figure iii. Major IAEA Committees in which the NRA participates

In addition, the NRA actively participates in and contributes to efforts to improve nuclear safety worldwide through the Regulatory Cooperation Forum (RCF; General Conference, steering committee and support meetings are held (once a year).), which is a framework for cooperation among regulatory bodies under the IAEA, and the Asia Nuclear Safety Network (ANSN; Japan serves as the Chair of the Steering Committee and the Chair and Vice Chair of the Self-Assessment Coordination Group (SACG).), which is a framework for cooperation to improve the safety of nuclear facilities in the Asian region. The NRA also collects technical information and shares knowledge and findings through the IAEA's cooperative projects.

(IAEA's major cooperative projects in which the NRA participates)

Project name	Overview
EESS-EBP	It develops detailed guides to the IAEA safety standards for external events.
IGALL	It formulates technological and practical guidelines for the aging deterioration management of systems, structures and components important for the safety of light-water and heavy-water reactors to ensure their long-term operations.
The joint project between the IAEA and Japan with regard to marine monitoring	In marine-monitoring activities joined by the IAEA at the coastal sea area of Fukushima Prefecture, the project takes samples in order to evaluate the method and mutual comparison of the analytical findings.

In response to requests from member states, the IAEA has been conducting peer reviews such as the Integrated Regulatory Review Service (IRRS), which comprehensively reviews nuclear regulation legal system and regulatory organizations. The NRA invited an IRRS mission in January 2016, an IRRS follow-up mission in January 2020, an International Physical Protection Advisory Service (IPPAS) mission (for reviewing the situation of nuclear security measures) in February 2015 and an IPPAS follow-up mission from November to December 2018.

(2) Organization for Economic Co-operation and Development/Nuclear Energy Agency (OECD/NEA)

Established in 1958, the OECD Nuclear Energy Agency (headed by Director-General Magwood, with 34 member countries as of March 2022) is headquartered in Paris and its activities are deliberated in steering committee meetings held twice a year. Benefiting from its characteristic of sharing the latest knowledge among advanced nuclear energy countries, the OECD/NEA discusses the prevention and mitigation of a possible nuclear accident and carries out related activities (including the sharing of OECD/NEA member countries' situations of regulatory efforts and joint safety research based on lessons learned from the accident at the Fukushima Daiichi Nuclear Power Station).

Among the standing committees, the Committee on Nuclear Regulatory Activities (CNRA), the Committee on the Safety of Nuclear Installations (CSNI), the Committee on Radiation Protection and Public Health (CRPPH), the Radioactive Waste Management Committee (RWMC) and working groups operating under them are studying various issues concerning nuclear safety, and also the NRA is actively participating in these activities.

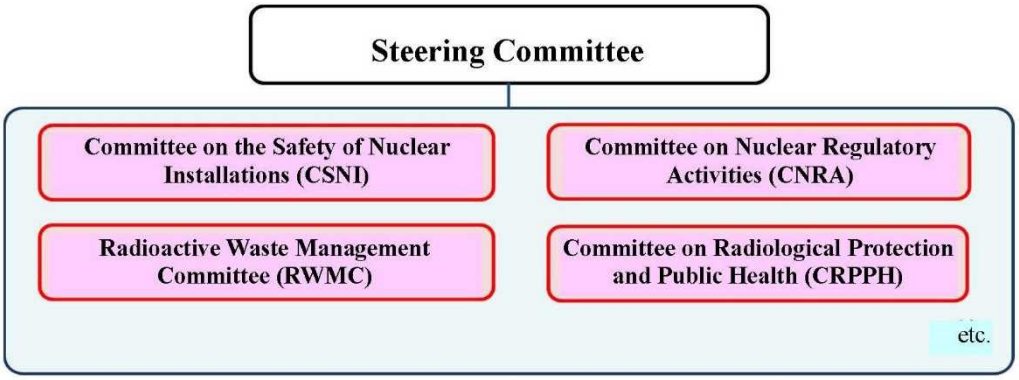


Figure iv. Major OECD/NEA committees relating to the NRA

In addition, the NRA has been joining various joint projects under the OECD/NEA, and contributing to the gathering of the latest technological information of advanced countries in order to make technological advancement.

(Major OECD/NEA joint projects in which the NRA participates)

Project name	Overview
ARC-F	Elaboration of the accident progression analysis of 1F, investigation of the inside of the reactor building and containment vessel, and information analysis related to the migration and diffusion of fission products are performed to gain a better understanding of the accident scenario and the conditions inside the building and vessel after the accident.
HYMERES	Performing experiments and analytical works on the behaviors of hydrogen accumulated in a containment during a severe accident progression.

(3) Record of NRA chairperson and committee members' participation in meetings held by international organizations

Date	Meeting held by international organization	Participant of the NRA
April 19-23, 2021	IAEA Advisory Group on Nuclear Security (AdSec) (online meeting)	Commissioner Tanaka
April 27-29, 2021	OECD/NEA/CNRA[1] Working Group on Safety Culture (WGSC) (online meeting)	Commissioner Ban
September 20, 2021	The 65th IAEA General Conference (Vienna)	Chairman Fuketa
October 11-15, 2021	IAEA Advisory Group on Nuclear Security (AdSec) (online meeting)	Commissioner Tanaka
November 8-12, 2021	International Conference on a Decade of Progress after Fukushima-Daiichi by IAEA (Vienna)	Commissioner Ban
November 23-25, 2021	OECD/NEA/CNRA Working Group on Safety Culture (WGSC) (online meeting)	Commissioner Ban

[1] Committee on Nuclear Regulatory Activities

(4) Record of Participation of NRA Chairperson and Committee Members in Meetings held by International Organizations

***After FY2018**

Period	Main participant from the NRA
May 2018	Secretary-General Yasui
September 2018	Chairman Fuketa
May 2019	Secretary-General Yasui
September 2019	Chairman Fuketa
September 2020	Chairman Fuketa
May 2021	Chairman Fuketa
September 2021	Chairman Fuketa

(5) Record of participation in Western European Nuclear Regulators Association (WENRA) meetings

***After FY2018**

Period	Main participant from the NRA
April 2018	Director of Nuclear Policy Planning Division, Ichimura
November 2018	Director of Nuclear Policy Planning Division, Ichimura
April 2019	Director of Nuclear Policy Planning Division, Ichimura
October 2019	Director-General Kaneko
November 2020	Director-General Kaneko
April 2021	Director-General Kaneko
October 2021	Director-General Kaneko

(6) Record of Participation in the Top Regulators Meeting on Nuclear Safety among Japan, China and the ROK (TRM)

***After FY2018**

Periods	Main participants from the NRA
November 2018	Commissioner Yamanaka
November 2019	Commissioner Ban
November to December 2021	Commissioner Ban

3. Bilateral Cooperation

(Organizations having signed a bilateral cooperation document (as of the end of March 2022))

Country	Organization
U.S.	Nuclear Regulatory Commission (NRC) Department of Energy (DOE)
France	Nuclear Safety Authority (ASN)
UK	Office for Nuclear Regulation (ONR)
Russian Federation (Russia)	Federal Environmental, Industrial and Nuclear Supervision Service of Russia (Rostechnadzor)
Sweden	Swedish Radiation Safety Authority (SSM)
Germany	Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB)
Spain	Spanish Nuclear Safety Council (CSN)
Finland	Finnish Radiation and Nuclear Safety Authority (STUK)
Canada	Canadian Nuclear Safety Commission (CNSC)

4. Overseas External Advisors

External Advisors and their careers

Richard Meserve	Former chairman of the U.S. Nuclear Regulatory Commission (NRC) Chairperson of International Nuclear Safety Advisory Group (INSAG), IAEA
Dana Drabova	Director-General of the Czech Republic (Czech) State Office for Nuclear Safety (SUJB) Former chairperson of IAEA Commission on Safety Standards (CSS)
Andy Hall	Former Chief Nuclear Inspector of the UK Office for Nuclear Regulation (ONR) Former chairperson of European Nuclear Safety Regulator Group (ENSREG)
Philippe Jamet	Former commissioner of the Nuclear Safety Authority (ASN), France Former director of the Division of Nuclear Installation Safety, IAEA
Randall Gauntt	Former director of the Severe Accident Analysis Department, Sandia National Laboratory, the USA

Reference 3 Materials related to Implementation of Regulations pertaining to the Reactor Regulation Act (related to Section 1 in Chapter 2)

1. Status of Applications and Approvals related to Conformity of Commercial Power Reactors to New Regulatory Requirements

Applicant	Targeted power reactor	Application type	Receipt date	Review Meeting (times)	Documentary review (times)	On-site investigation (times)	Date of approval
Hokkaido Electric Power Co., Inc.	Tomari NPS (Units 1, 2)	Basic design change Design and construction plan Operational safety program change	July 8, 2013	-	-	-	-
	Tomari NPS (Unit 3)	Basic design change Design and construction plan Operational safety program change	July 8, 2013	12	-	-	-
	◆Tomari NPS (Unit 3)	Basic design change	December 18, 2015	-	-	-	-
Tohoku Electric Power Co., Inc.	Onagawa NPS (Unit 2)	Basic design change Design and construction plan Operational safety program change	December 27, 2013	8	-	-	February 26, 2020 December23, 2021 -
	◆Onagawa NPS (Unit 2)	Basic design change	January 6, 2022	2	-	-	-
	Higashidori NPS (Unit 1)	Basic design change Design and construction plan Operational safety program change	June 10, 2014	6	-	-	-
Tokyo Electric Power Company Holdings, Inc.	Kashiwazaki-Kariwa NPS (Units 6, 7)	Basic design change Design and construction plan Operational safety program change	September 27, 2013	-	-	-	December 27, 2017 October 14, 2020 (Unit 7) October 30, 2020 (Unit 7)
	◆ Kashiwazaki-Kariwa NPS (Units 6, 7)	Basic design change	December 15, 2014	10	-	2	-
Chubu Electric Power Co., Inc.	Hamaoka NPS (Unit 3)	Basic design change	June 16, 2015	5	-	-	-
	Hamaoka NPS (Unit 4)	Basic design change Design and construction plan Operational safety program change	February 14, 2014 January 26, 2015 *1	5	-	-	-

Applicant	Targeted power reactor	Application types	Receipt date	Review Meetings (times)	Documentary review (times)	On-site investigations (times)	Date of approval
Hokuriku Electric Power Company	Shika NPS (Unit 2)	Basic design change	August 12, 2014	3	-	1	-
		Design and construction plan					
		Operational safety program change					
Kansai Electric Power Company	Ohi PS (Units 3, 4)	Basic design change	July 8, 2013	-	-	-	May 24, 2017
		Design and construction plan					August 25, 2017
		Operational safety program change					September 1, 2017
	◆Ohi PS (Units 3, 4)	Basic design change	March 8, 2019	3	-	-	February 26, 2020
		Design and construction plan[*3]	March 6, 2020 August 26, 2020				December 22, 2020 August 24, 2021
		Operational safety program	September 17, 2021				March 24, 2022
	Takahama PS (Units 3, 4)	Basic design change	July 8, 2013	-	-	-	February 12, 2015
		Design and construction plan					August 4, 2015 (Unit 3) October 9, 2015 (Unit 4)
		Operational safety program change					October 9, 2015
	◆Takahama PS (Units 3, 4)	Basic design change	December 25, 2014	-	-	-	September 21, 2016
		Design and construction plan	April 26, 2017				August 7, 2019
		Operational safety program change	April 17, 2020				October 7, 2020
	Takahama PS (Units 1 and 2 (3, 4))	Basic design change	March 17, 2015	-	-	-	April 20, 2016
		Design and construction plan	July 3, 2015				June 10, 2016 (Units 1, 2)
		Operational safety program change	July 31, 2019				February 15, 2021
	◆Takahama PS (Units 1 and 2 (3, 4))	Basic design change	December 22, 2016	-	-	-	March 7, 2018
		Design and construction plan[*3]	March 8, 2018 November 16, 2018 March 15, 2019 May 31, 2019				April 25, 2019 September 13, 2019 October 24, 2019 February 20, 2020
	Mihama PS (Unit 3)	Basic design change	March 17, 2015	-	-	-	October 5, 2016
		Design and construction plan	November 26, 2015				October 26, 2016
		Operational safety program change	March 17, 2015				February 27, 2020
	◆Mihama PS (Unit 3)	Basic design change	April 20, 2018	2	-	-	July 8, 2020
		Design and construction plan	July 10, 2020				April 6, 2021
		Operational safety program	September 17, 2021				March 25, 2022

Applicant	Targeted power reactor	Application types	Receipt date	Review Meetings (times)	Documentary review (times)	On-site investigations (times)	Date of approval
Chugoku Electric Power Company	Shimane NPS (Unit 2)	Basic design change	December 25, 2013	3	-	-	September 15, 2021
		Design and construction plan					-
		Operational safety program change					-
	◆Shimane NPS (Unit 2)	Basic design change	July 4, 2016	1	-	-	-
	Shimane NPS (Unit 3)	Basic design change	August 10, 2018	-	-	-	-
Shikoku Electric Power Company	Ikata NPS (Unit 3)	Basic design change	July 8, 2013	-	-	-	July 15, 2015
		Design and construction plan					March 23, 2016
		Operational safety program change					April 19, 2016
	◆Ikata NPS (Unit 3)	Basic design change	January 14, 2016	-	-	-	October 4, 2017
		Design and construction plan[*3]	December 7, 2017 March 16, 2018 May 11, 2018 August 13, 2018 July 11, 2019				March 25, 2019 December 24, 2019 March 27, 2020 October 10, 2019 March 27, 2020
		Operational safety program change	November 27, 2020				April 28, 2021
Kyushu Electric Power Company	Genkai NPS (Units 3, 4)	Basic design change	July 12, 2013	-	-	-	January 18, 2017
		Design and construction plan					August 25, 2017 (Unit 3) September 14, 2017 (Unit 4)
		Operational safety program change					September 14, 2017
	Sendai NPS (Units 1, 2)	Basic design change	July 8, 2013	-	-	-	September 10, 2014
		Design and construction plan					March 18, 2015 (Unit 1) May 22, 2015 (Unit 2)
		Operational safety program change					May 27, 2015
	◆Genkai NPS (Units 3, 4)	Basic design change	December 20, 2017	2	-	-	April 3, 2019
		Design and construction plan[*3] (Unit 3)	May 16, 2019 September 19, 2019 January 17, 2020				November 28, 2019 March 4, 2020 August 26, 2020
		Design and construction plan[*3] (Unit 4)	June 18, 2019 September 19, 2019 January 17, 2020				November 28, 2019 March 4, 2020 August 26, 2020
		Operational safety program	August 10, 2021				March 24, 2022
	◆Sendai NPS (Units 1, 2)	Basic design change	December 17, 2015	-	-	-	April 5, 2017
		Design and construction plan*3 (Unit 1)	May 24, 2017 August 8, 2017 March 9, 2018				May 15, 2018 July 26, 2018 February 18, 2019
		Design and construction	July 10, 2017				August 10, 2018

		plan*3 (Unit 2)	August 8, 2017 March 9, 2018				August 31, 2018 April 12, 2019
		Operational safety program change	August 2, 2019				March 25, 2020
Applicant	Targeted power reactor	Application types	Receipt date	Review Meetings (times)	Documentary review (times)	On-site investigations (times)	Date of approval
Japan Atomic Power Company	Tokai Daini NPS	Basic design change	May 20, 2014	-	-	-	September 26, 2018
		Design and construction plan					October 18, 2018
		Operational safety program change					-
	◆Tokai Daini NPS	Basic design change	September 24, 2019	11	-	2	December 22, 2021
		Design and construction plan*3	February 28, 2022				-
	Tsuruga NPS (Unit 2)	Basic design change	November 5, 2015	-	-	-	-
		Operational safety program change					
Electric Power Development Co., Ltd	Oma NPS*2	Basic design change	December 16, 2014	8	-	-	-
		Design and construction plan					

- Several applications may be reviewed at one session of the review meeting.
- The number of review meetings mainly attended by members of the NRA is mentioned as a rule.
- The number of on-site investigations implemented by the members of the NRA is mentioned, and that implemented only by the staff of the secretariat of the NRA is excluded.
- The numbers of review, meetings and on-site investigations represent the number of times held in FY2021

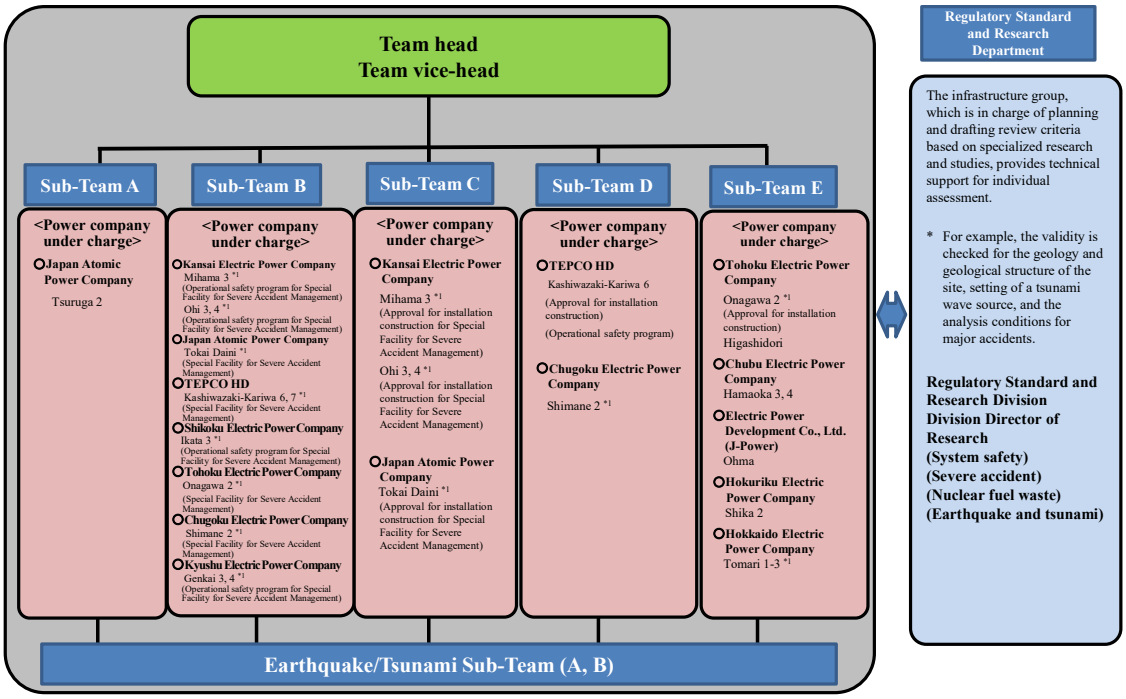
◆: Application for Special Facility for Severe Accident Management

*1: Application for reactor installation permit change of nuclear power reactor dated February 14, 2014, was withdrawn on January 26, 2015, and submitted again in order to add a dry storage facility for spent fuel.

*2: This application includes contents regarding Special Facility for Severe Accident Management.

*3: The design and construction plan is divided into several phases and separate applications are submitted.

2. Review System of Conformity of Nuclear Power Stations to New Regulatory Requirements



*1: Sites reviewed in FY2021

Figure v. Review System of Conformity of Nuclear Power Stations to New Regulatory Requirements

3 Status of Inspection in Major Nuclear Facilities

1. Status of Nuclear Regulatory Inspections

(1) Inspection Findings in the 4th Quarter of FY2020

(Nuclear facility safety and radiation safety)

		Subject	Overview	Safety significance Severity level
Fourth quarter 2020	1	Wear on steam generator heat transfer tubes due to scales generated by inadequate maintenance at Unit 4 of Takahama PS	During the 23rd periodic outage of Takahama PS Unit 4, a total of four heat transfer tubes with a wear exceeding 20% of the tube were found in two of the three steam generators (wall wearing rates of approximately 33% for A-SG, approximately 36%, approximately 25% and approximately 32% for C-SG).	Green SL IV
	2	Inadequate fire mitigation measures due to improper cable installation at Units 3 and 4 of Takahama PS	As a result of lateral spread by the operator in response to inspection findings (inadequate fire mitigation measures due to inappropriate cable installation) at other operators (Ikata and Sendai), cables exposed from cable trays with fireproof bulkheads were found in 52 locations in 9 fire compartments in Unit 3 and 53 locations in 9 fire compartments in Unit 4.	Green SL IV
	3	Inadequate fire mitigation measures due to improper cable installation at Units 3 and 4 of Ohi PS	As a result of lateral spread by the operator in response to inspection findings (inadequate fire mitigation measures due to inappropriate cable installation) at other operators (Ikata and Sendai), cables exposed from cable trays with fireproof bulkheads were found in 33 locations in 9 fire compartments in Unit 3 and 34 locations in 10 fire compartments in Unit 4.	Green SL IV
	4	Improper dust sampling of the Urasoko monitoring post at Tsuruga NPS	The dust sampler installed inside the monitoring post facility was inhaling air inside the facility when it should have been measuring radiation using air outside the facility as a sample.	Green SL IV
	5	Multiple cases of inappropriate management of entry time into the controlled area at Unit 3 of Mihama PS	Although there were many cases of workers entering the controlled area without passing through the control gate where they registered their digital personal dosimeters with alarms, appropriate non-conformity management was not conducted at the entry control room of the controlled area.	Green SL IV
	6	Exceeding dose rate (estimate) at the boundary of the controlled area due to inadequate storage of radioactive waste in the waste storage (A) at Takahama PS	The dose rate measured outside the solid waste storage was higher than the control standard at the boundary of the controlled area because inadequate shielding measures were taken for the drum cans with relatively high dose.	Green SL IV
	7	Improper installation of smoke detectors in the pull box in the seawater pipe trench area at Units 3 and 4 of Genkai NPS	Smoke detectors for fire prevention were not properly installed in the pull box that stored the power cables of the seawater pump.	Green SL IV

(Physical protection of nuclear material)

		Subject	Overview	Safety significance Severity level
The 4th quarter	8	Physical protection of nuclear material cases at Fukushima Daini NPS, TEPCO (entry approval)	ID cards that were no longer needed for operation were invalidated but not collected.	Green SL IV
	9	Physical Protection of nuclear material cases at Ikata NPS, Shikoku Electric Power Co., Inc. (physical protection)	Openings were not completely closed.	Green SL IV
	10	Physical Protection of nuclear material cases at Hamaoka NPS, Chubu Electric Power Co., Inc. (entry approval)	Temporary visitors who needed to work, etc. entered the area without undergoing part of the temporary entry approval procedure.	Green SL IV
	11	Physical protection of nuclear material cases at Fukushima Daini NPS, TEPCO (physical protection)	There was an uncontrolled passage door at the boundary of the area.	Green SL IV
	12	Physical protection of nuclear material cases at Fukushima Daini NPS, TEPCO (entry approval, access control)	An entrance was not inspected as prescribed.	Green SL IV

(Evaluation of severity level only)

* No evaluation for severity level solely in the 4th quarter of FY2020.

(2) Results of FY2020
(Routine inspection (power reactor))

No	Guide No.	Inspection guide name	Sendai	Genkai	Ikata	Takahama	Ohi	Mihama
			Units 1, 2: In operation	Unit 1, 2: Decommissioning A Unit 3, 4: In operation	Unit 1: Decommissioning B Unit 2: Decommissioning A Unit 3: In operation	Unit 1, 2: Long-term shutdown Unit 3, 4: In operation	Unit 1, 2: Decommissioning A Unit 3, 4: In operation	Unit 1, 2: Decommissioning A Unit 3: Long-term shutdown
1	BM0020	Oversight of operator's periodic inspection *	12	19	26	33	12	11
2	BM1040	Heat sink performance	2	4	2	9	5	1
3	BM0060	Maintenance effectiveness assessments	5	9	5	10	6	1
4	BM0100	Design control	7	11	6	7	6	1
5	BM0110	Work control	10	5	13	7	6	5
6	BO0010	Surveillance testing	19	29	25	27	23	6
7	BO1020	System configuration of equipment	21	23	19	22	22	5
8	BO1030	Reactor start-up and shutdown	2	2	0	1	2	0
9	BO1040	Operability determinations and functionality assessments	22	26	20	26	25	5
10	BO0060	Nuclear fuel control (Transportation and storage)	3	5	5	3	4	2
11	BO1070	Capability of operating personnel	3	5	18	5	5	2
12	BE0010	Protection against natural disaster	7	4	5	4	6	3
13	BE0020	Fire protection	15	15	23	12	21	7
14	BE0030	Internal flood protection	3	4	4	6	5	1
15	BE0040	Maintaining of emergency response organization	1	2	5	6	1	2
16	BE0050	Emergency preparedness and maintenance	2	3	2	1	2	2
17	BE0060	Maintaining personal capacity to respond to severe accidents, etc.	10	16	25	13	10	2
18	BE0090	Seismic protection	5	4	5	4	4	1
19	BE0100	Tsunami protection	5	4	5	4	4	1
20	BR0010	Radiation exposure control	6	7	7	6	8	6
21	BR0070	Radioactive solid waste management	3	3	5	6	3	4
22	BQ0010	Operation of Quality Management System (Routine)	1	1	1	1	1	1
23		Operation of Quality Management System (Semi-annual)	1	1	2	1	2	2
24	BQ0040	Performance Indicator Verification	1	1	3	1	1	1
25	BQ0050	Initial response to occurrence of an event	0	1	0	1	2	2
		Total	166	204	231	216	186	74

[Legend]

(1) "Operation": In service in compliance with new regulatory requirements.
(2) "Long-term shutdown": Long-term shutdown in preparation for compliance with new regulatory requirements
(3) "Decommissioning A": Decommissioning approved with spent fuel in SFP The same inspection is performed as in the long-term shutdown.
(4) "Decommissioning B": Decommissioning approved with no spent fuel in SFP
(5) "Decommissioning review": Under review for decommissioning. The same inspection is performed as long-term shutdown.
(6) "Decommissioning planned": Planned to apply for decommissioning. The same inspection is performed as long-term shutdown.
(7) "Construction A": In the construction phase with no new fuel delivered.
(8) "Construction B": In the construction phase with new fuel delivered. The same inspection is performed as long-term shutdown

* The number of inspection samples for long-term shutdown and decommissioning A/B in No.1 "Supervision for Periodic Operator's Inspection" is 1/reactor.

No	Guide No.	Inspection guide name	Tomari	Higashidori	Onagawa	Kashiwazaki	Fukushima Daini	Tokai
			Unit 3: Long-term shutdown	Unit 1: Long-term shutdown	Unit 1: Decommissioning A Unit 2,3: Long-term shutdown	Unit 1-7: Long-term shutdown	Unit 1-4: Decommissioning review	Unit 1: Decommissioning B Unit 2: Long-term shutdown
1	BM0020	Oversight of operator's periodic inspection *	0	0	0	2	0	0
2	BM1040	Heat sink performance	4	1	2	2	1	1
3	BM0060	Maintenance effectiveness assessments	1	2	2	1	1	1
4	BM0100	Design control	1	2	2	1	1	3
5	BM0110	Work control	11	6	5	12	3	8
6	BO0010	Surveillance testing	11	3	6	9	6	3
7	BO1020	System configuration of equipment	6	2	6	8	6	5
8	BO1030	Reactor start-up and shutdown	0	0	0	0	0	0
9	BO1040	Operability determinations and functionality assessments	8	4	7	10	6	5
10	BO0060	Nuclear fuel control (Transportation and storage)	2	1	1	1	1	1
11	BO1070	Capability of operating personnel	7	2	5	3	5	3
12	BE0010	Protection against natural disaster	2	2	2	2	2	4
13	BE0020	Fire protection	9	7	7	7	9	8
14	BE0030	Internal flood protection	2	0	1	1	2	1
15	BE0040	Maintaining of emergency response organization	1	3	4	2	2	1
16	BE0050	Emergency preparedness and maintenance	2	2	3	0	2	5
17	BE0060	Maintaining personal capacity to respond to severe accidents, etc.	0	0	0	3	0	0
18	BE0090	Seismic protection	2	0	1	1	3	1
19	BE0100	Tsunami protection	1	0	3	1	1	2
20	BR0010	Radiation exposure control	6	4	5	7	5	7
21	BR0070	Radioactive solid waste management	3	4	5	3	4	4
22	BQ0010	Operation of Quality Management System (Routine)	1	1	1	1	1	1
23		Operation of Quality Management System (Semi-annual)	1	1	1	2	1	1
24	BQ0040	Performance Indicator Verification	1	1	1	1	1	1
25	BQ0050	Initial response to occurrence of an event	0	1	2	0	0	0
		Total	82	49	72	80	63	66

[Legend]
(1) "Operation": In service in compliance with new regulatory requirements.
(2) "Long-term shutdown": Long-term shutdown in preparation for compliance with new regulatory requirements
(3) "Decommissioning A": Decommissioning approved with spent fuel in SFP The same inspection is performed as in the long-term shutdown.
(4) "Decommissioning B" Decommissioning approved with no spent fuel in SFP
(5) "Decommissioning review": Under review for decommissioning. The same inspection is performed as long-term shutdown.
(6) Decommissioning planned": Planned to apply for decommissioning. The same inspection is performed as long-term shutdown.
(7) "Construction A": In the construction phase with no new fuel delivered.
(8) "Construction B": In the construction phase with new fuel delivered. The same inspection is performed as long-term shutdown
* The number of inspection samples for long-term shutdown and decommissioning A/B in No.1 "Supervision for Periodic Operator's Inspection" is 1/reactor.

No	Guide No.	Inspection guide name	Hamaoka Unit 1, 2: Decommissioning B Unit 3-5: Long-term shutdown	Shika Unit 1,2: Long-term shutdown	Tsuruga Unit 1: Decommissioning A Unit 2: Long-term shutdown	Shimane Unit 1: Decommissioning A Unit 2: Long-term shutdown Unit 3: Construction B	Ohma Unit 1: Construction A	(TEPCO) Higashidori Unit 1: Construction A
1	BM0020	Oversight of operator's periodic inspection *	1	0	0	4	-	-
2	BM1040	Heat sink performance	1	2	4	1	-	-
3	BM0060	Maintenance effectiveness assessments	1	3	8	1	-	-
4	BM0100	Design control	2	1	1	3	-	-
5	BM0110	Work control	4	12	18	13	-	-
6	BO0010	Surveillance testing	6	7	10	6	-	-
7	BO1020	System configuration of equipment	6	4	6	6	-	-
8	BO1030	Reactor start-up and shutdown	0	0	0	0	-	-
9	BO1040	Operability determinations and functionality assessments	6	9	9	5	-	-
10	BO0060	Nuclear fuel control (Transportation and storage)	1	1	2	2	-	-
11	BO1070	Capability of operating personnel	1	3	8	7	-	-
12	BE0010	Protection against natural disaster	2	2	2	4	-	-
13	BE0020	Fire protection	7	13	10	8	-	-
14	BE0030	Internal flood protection	3	1	1	2	-	-
15	BE0040	Maintaining of emergency response organization	2	4	3	1	-	-
16	BE0050	Emergency preparedness and maintenance	1	1	2	3	-	-
17	BE0060	Maintaining personal capacity to respond to severe accidents, etc.	0	0	0	0	-	-
18	BE0090	Seismic protection	1	1	1	1	-	-
19	BE0100	Tsunami protection	1	1	1	2	-	-
20	BR0010	Radiation exposure control	5	6	6	5	-	-
21	BR0070	Radioactive solid waste management	4	3	4	6	-	-
22	BQ0010	Operation of Quality Management System (Routine)	1	1	1	1	-	-
23		Operation of Quality Management System (Semi-annual)	1	1	2	1	-	-
24	BQ0040	Performance Indicator Verification	1	1	1	1	-	-
25	BQ0050	Initial response to occurrence of an event	0	0	0	0	-	-
		Total	58	77	100	83	0	0

[Legend]
(1) "Operation": In service in compliance with new regulatory requirements.
(2) "Long-term shutdown": Long-term shutdown in preparation for compliance with new regulatory requirements
(3) "Decommissioning A": Decommissioning approved with spent fuel in SFP The same inspection is performed as in the long-term shutdown.
(4) "Decommissioning B": Decommissioning approved with no spent fuel in SFP
(5) "Decommissioning review": Under review for decommissioning. The same inspection is performed as long-term shutdown.
(6) "Decommissioning planned": Planned to apply for decommissioning. The same inspection is performed as long-term shutdown.
(7) "Construction A": In the construction phase with no new fuel delivered.
(8) "Construction B": In the construction phase with new fuel delivered. The same inspection is performed as long-term shutdown
* The number of inspection samples for long-term shutdown and decommissioning A/B in No.1 "Supervision for Periodic Operator's Inspection" is 1/reactor.

(Routine inspection (nuclear fuel cycle facilities, etc.))

No	Guide No.	Inspection guide name	Responcessing	Fabrication					Management and burial
			JNFL Rokkasho Reprocessing Facility	Global Nuclear Fuel Japan	Kumatori Office, Nuclear Fuel Industries	Tokai Office, Nuclear Fuel Industries	Mitsubishi Nuclear Fuel	JNFL Fabrication Facility	JNFL MOX Fabrication Facility	JNFL Waste management facility
1	BM0020	Oversight of operator's periodic inspection	6	0	18	8	5	14		4
2	BM1040	Heat sink performance								
3	BM0060	Maintenance effectiveness assessments	6	0	5	3	3	3		3
4	BM0100	Design control	17	0	4	1	2	3		1
5	BM0110	Work control	33	5	37	4	5	3	3	2
6	BO0010	Surveillance testing	16	7	7	8	7	7		3
7	BO1020	System configuration of equipment								
8	BO1030	Reactor start-up and shutdown								
9	BO1040	Operability determinations and functionality assessments								
10	BO0060	Nuclear fuel control (Transportation and storage)	2	1	1	0	0			
11	BO1070	Capability of operating personnel								
12	BO2010	Operation management	23	5	8	7	8	9		4
13	BO2020	Critical safety management	11	1	4	3	3	4		
14	BO2030	Experiment								
15	BE0010	Protection against natural disaster	4	0	4	2	2	2		1
16	BE0020	Fire protection	20	1	7	7	7	7		2
17	BE0030	Internal flood protection	7	0	5	0	1	1		1
18	BE0040	Maintaining of emergency response organization	2	1	1	1	2	1		1
19	BE0050	Emergency preparedness and maintenance	5	0	1	1	1	1		1
20	BE0060	Maintaining personal capacity to respond to severe accidents, etc.	5	3	7	5	4	5		
21	BE0090	Seismic protection	8	1	3	2	2	2		1
22	BE0100	Tsunami protection								
23	BR0010	Radiation exposure control	18	4	10	10	10	10		3
24	BR0070	Radioactive solid waste management	8	4	5	4	3	3		3
25	BQ0010	Operation of Quality Management System (Routine)	1	1	1	1	1	1	1	1
26		Operation of Quality Management System (Semi-annual)	2	0	0	2	4	2	1	2
27	BQ0040	Performance Indicator Verification	0	0	0	0	0	0		0
28	BQ0050	Initial response to occurrence of an event	0	0	0	0	0	0	0	2
		Total	194	34	128	69	70	78	5	35

(Note) "/" in the table means there is no inspection target.

No	Guide No.	Inspection guide name	Management and burial			Storage	Use			
			JNFL	Japan Atomic Energy Agency						
			Waste Disposal Facility	Nuclear Science Research Institute (Waste Disposal Facility)	Oarai Research and Development Institute (Specified Radioactive Waste Interim Storage Facility)	Recyclable-Fuel Storage Center	Rokkasho Safeguards Center	Tokai Safeguards Center	Nippon Nuclear Fuel Development (NFD)	Nuclear Development (NDC)
1	BM0020	Oversight of operator's periodic inspection			3					
2	BM1040	Heat sink performance								
3	BM0060	Maintenance effectiveness assessments	2	0	2		1	1	1	4
4	BM0100	Design control	1	0	1		1	1	1	1
5	BM0110	Work control	8	4	8		1	2	1	4
6	BO0010	Surveillance testing			3		1	1	2	6
7	BO1020	System configuration of equipment								
8	BO1030	Reactor start-up and shutdown								
9	BO1040	Operability determinations and functionality assessments								
10	BO0060	Nuclear fuel control (Transportation and storage)							3	1
11	BO1070	Capability of operating personnel								
12	BO2010	Operation management	4	0	5		3	3	2	2
13	BO2020	Critical safety management			0		1	1	2	3
14	BO2030	Experiment								
15	BE0010	Protection against natural disaster	1	1	1		1	2	1	2
16	BE0020	Fire protection	1	0	3		1	1	1	2
17	BE0030	Internal flood protection	1	0	1		1	1	1	1
18	BE0040	Maintaining of emergency response organization	1	0	2		1	1	1	1
19	BE0050	Emergency preparedness and maintenance	1	0	1		1	1	1	2
20	BE0060	Maintaining personal capacity to respond to severe accidents, etc.								
21	BE0090	Seismic protection	1	0	2		1	1	1	2
22	BE0100	Tsunami protection								
23	BR0010	Radiation exposure control	2	0	2		3	3	2	4
24	BR0070	Radioactive solid waste management	1	0	0		1	1	1	2
25	BQ0010	Operation of Quality Management System (Routine)	1	1	1	1	1	1	1	1
26		Operation of Quality Management System (Semi-annual)	2	1	2	1	2	1	1	3
27	BQ0040	Performance Indicator Verification	0	0	0		0	0	0	0
28	BQ0050	Initial response to occurrence of an event	0	0	0	0	0	0	0	0
		Total	27	7	37	2	21	22	23	41

(Note) "/" in the table means there is no inspection target.

No	Guide No.	Inspection guide name	Use							Testing reactor
			Nuclear Fuel Cycle Engineering Laboratories, JAEA	Nuclear Science Research Institute, JAEA	Oarai Research and Development Institute, JAEA (south)	Oarai Research and Development Institute, JAEA (north)	Toshiba Nuclear Engineering Laboratory	Special Nuclear Fuel Storage Room, Institute for Integrated Radiati and Nuclear Science, Kyoto University	Ningyo-toge Environmental Engineering Center, JAEA	Toshiba Nuclear Critical Assembly (NCA) (decommissioning planned)
1	BM0020	Oversight of operator's periodic inspection								11
2	BM1040	Heat sink performance								
3	BM0060	Maintenance effectiveness assessments	1	1	1	1	1		1	1
4	BM0100	Design control	1	2	1	1	2		1	1
5	BM0110	Work control	2	1	4	4	5	1	2	5
6	BO0010	Surveillance testing	1	1	3	3	1	0	1	4
7	BO1020	System configuration of equipment								
8	BO1030	Reactor start-up and shutdown								
9	BO1040	Operability determinations and functionality assessments								
10	BO0060	Nuclear fuel control (Transportation and storage)	1	1	1	1	2	1	1	2
11	BO1070	Capability of operating personnel								
12	BO2010	Operation management	2	3	4	4	2		2	3
13	BO2020	Critical safety management	2	1	1	1	1	2	1	
14	BO2030	Experiment								2
15	BE0010	Protection against natural disaster	1	1	1	1	1		2	1
16	BE0020	Fire protection	3	1	3	3	1		4	2
17	BE0030	Internal flood protection	1	1	1	1	1		2	1
18	BE0040	Maintaining of emergency response organization	1	1	1	1	2		1	2
19	BE0050	Emergency preparedness and maintenance	1	1	1	1	1		1	1
20	BE0060	Maintaining personal capacity to respond to severe accidents, etc.								
21	BE0090	Seismic protection	2	1	2	2	1	1	1	1
22	BE0100	Tsunami protection	0							
23	BR0010	Radiation exposure control	2	2	2	2	12	3	3	15
24	BR0070	Radioactive solid waste management	1	1	1	0	8	0	1	0
25	BQ0010	Operation of Quality Management System (Routine)	1	1	1	1	1		1	1
26		Operation of Quality Management System (Semi-annual)	1	1	1	1	3		5	3
27	BQ0040	Performance Indicator Verification	0	0	0	0	0	0	0	0
28	BQ0050	Initial response to occurrence of an event	0	0	0	0	0	0	0	0
		Total	24	21	29	28	45	8	30	56

(Note) "/" in the table means there is no inspection target.

No	Guide No.	Inspection guide name	Testing reactor							
			Kyoto University		Atomic Energy Research Institute, Kindai University (UTR)	Nuclear Science Research Institute				Oarai Research and Development Institute (south)
			Kyoto University Critical Assembly (KUCA), Institute for Integrated Radiation and Nuclear Science	Institute for Integrated Radiation and Nuclear Science (KUR)		Fast Critical Assembly (FCA)	JRR-3 (including radioactive waste processing site)	Static Experiment Critical Facility (STACY)	Nuclear Safety Research Reactor (NSRR)	Experimental Fast Reactor (Joyo)
1	BM0020	Oversight of operator's periodic inspection	5	14	4	4	4	4	4	6
2	BM1040	Heat sink performance								
3	BM0060	Maintenance effectiveness assessments	1	2	1	2	2	2	2	1
4	BM0100	Design control	1	1	0	1	2	2	2	1
5	BM0110	Work control	0	6	2	2	4	2	2	6
6	BO0010	Surveillance testing	3	6	1	1	3	1	1	5
7	BO1020	System configuration of equipment								
8	BO1030	Reactor start-up and shutdown								
9	BO1040	Operability determinations and functionality assessments								
10	BO0060	Nuclear fuel control (Transportation and storage)	3	2	2	1	1	1	1	1
11	BO1070	Capability of operating personnel								
12	BO2010	Operation management	1	7	5	3	6	3	3	8
13	BO2020	Critical safety management								
14	BO2030	Experiment	2	6	3	2	2	2	2	0
15	BE0010	Protection against natural disaster	1	1	0	1	1	2	2	1
16	BE0020	Fire protection	5	7	3	3	6	3	3	3
17	BE0030	Internal flood protection	1	1	0	1	1	1	1	1
18	BE0040	Maintaining of emergency response organization	1	1	2	2	2	2	2	3
19	BE0050	Emergency preparedness and maintenance	1	1	5	2	2	2	2	1
20	BE0060	Maintaining personal capacity to respond to severe accidents, etc.								
21	BE0090	Seismic protection	1	1	1	1	1	1	1	1
22	BE0100	Tsunami protection								
23	BR0010	Radiation exposure control	8	6	4	3	8	3	3	6
24	BR0070	Radioactive solid waste management	3	3	2	2	4	2	2	2
25	BQ0010	Operation of Quality Management System (Routine)	1	1	1	1	1	1	1	1
26		Operation of Quality Management System (Semi-annual)	0	0	1	1	1	1	1	1
27	BQ0040	Performance Indicator Verification	0	0	0	0	0	0	0	0
28	BQ0050	Initial response to occurrence of an event	0	0	0	0	0	0	0	0
		Total	38	66	37	33	51	35	35	48

(Note) "/" in the table means there is no inspection target.

No	Guide No.	Inspection guide name	Testing reactor	Decommissioning measure						
			Oarai Research and Development Institute (north)						Nuclear Science Research Institute	
			High Temperature engineering Test Reactor (HTTR)	Tokai Reprocessing Plant, Nuclear Fuel Cycle Engineering Laboratories	Institute for Atomic Energy, Rikkyo University (no nuclear fuel materials in the plants, etc.)	Hitachi Training Reactor at Hitachi Ozenji Center (HTR) (no nuclear fuel materials in the plants, etc.)	Toshiba (TTR1) (no nuclear fuel materials in the plants, etc.)	Atomic Energy Research Laboratory, Tokyo City University (no nuclear fuel materials in the plants, etc.)	Transient Experiment Critical Facility (TRACY) (no nuclear fuel materials in the plants, etc.)	JRR-2 (no nuclear fuel materials in the plants, etc.)
1	BM0020	Oversight of operator's periodic inspection	5	6	1	3	5	4	4	4
2	BM1040	Heat sink performance								
3	BM0060	Maintenance effectiveness assessments	1	5	0	2	1	3	2	2
4	BM0100	Design control	1	6	0	0	3	0	1	1
5	BM0110	Work control	5	5		2	7			2
6	BO0010	Surveillance testing	4	14						1
7	BO1020	System configuration of equipment								
8	BO1030	Reactor start-up and shutdown								
9	BO1040	Operability determinations and functionality assessments								
10	BO0060	Nuclear fuel control (Transportation and storage)	1	2						
11	BO1070	Capability of operating personnel								
12	BO2010	Operation management	9	10			3			
13	BO2020	Critical safety management		10						
14	BO2030	Experiment	0							
15	BE0010	Protection against natural disaster	1	4		1		2		1
16	BE0020	Fire protection	3	13		1	1	2		3
17	BE0030	Internal flood protection	1	2						1
18	BE0040	Maintaining of emergency response organization	2	3		1	2	1		
19	BE0050	Emergency preparedness and maintenance	2	1		2	1	1		
20	BE0060	Maintaining personal capacity to respond to severe accidents, etc.		2						
21	BE0090	Seismic protection	1	4			1			1
22	BE0100	Tsunami protection		4						
23	BR0010	Radiation exposure control	6	6	0	2	17	4	3	3
24	BR0070	Radioactive solid waste management	2	3	0	2	1	2	2	2
25	BQ0010	Operation of Quality Management System (Routine)	1	1	1	1	1	1	1	1
26		Operation of Quality Management System (Semi-annual)	1	1		1	3		1	1
27	BQ0040	Performance Indicator Verification	0	0	0	0	0	0	0	0
28	BQ0050	Initial response to occurrence of an event	0	0	0	0	0	0	0	0
		Total	46	102	2	18	46	20	14	23

(Note) "/" in the table means there is no inspection target.

No	Guide No.	Inspection guide name	Decommissioning measure								
			Nuclear Science Research Institute		Oarai Research and Development Institute (south)	Oarai Research and Development Institute (north)					
			Tank-type critical assembly (TCA) (Contains nuclear fuel materials in the plants, etc.)	JRR-4 (no nuclear fuel materials in core)	Deuterium Critical Assembly (DCA) (no nuclear fuel materials in core)	Japan Materials Test Reactor (JMTR) (no nuclear fuel materials in core)	University of Tokyo Nuclear Reactor "Yayoi" (no nuclear fuel materials in core)	First Nuclear Ship's reactor (no nuclear fuel materials in the plants, etc.)	Ningyo-toge Environmental Engineering Center, JAEA (Contains nuclear fuel materials in the plants, etc.)	Prototype Advanced Converter Seactor (Fugen) (no nuclear fuel materials in core)	Prototype Fast Breeder (Monju) (Contains nuclear fuel materialsin core)
1	BM0020	Oversight of operator's periodic inspection	4	4	1	6	3	1	10	8	23
2	BM1040	Heat sink performance									1
3	BM0060	Maintenance effectiveness assessments	2	2	1	2	0	0	3	3	6
4	BM0100	Design control	1	2	1	1	0		2	2	6
5	BM0110	Work control	2	2	1	1	2	1	3	11	7
6	BO0010	Surveillance testing	1	1	1	3	2	0	7	3	14
7	BO1020	System configuration of equipment								9	7
8	BO1030	Reactor start-up and shutdown									
9	BO1040	Operability determinations and functionality assessments								2	8
10	BO0060	Nuclear fuel control (Transportation and storage)	1	1	1	1	1		1	1	24
11	BO1070	Capability of operating personnel									0
12	BO2010	Operation management	3		6	8			3		
13	BO2020	Critical safety management							2		
14	BO2030	Experiment	1			0					
15	BE0010	Protection against natural disaster	1	1	1	1	1	1	2	1	4
16	BE0020	Fire protection	3	3	2	2	2	5	7	11	9
17	BE0030	Internal flood protection	1	1	1	1	1	1	2	2	3
18	BE0040	Maintaining of emergency response organization	2	2	0	1	1		1	2	1
19	BE0050	Emergency preparedness and maintenance	2	2	1	1	2		1	1	1
20	BE0060	Maintaining personal capacity to respond to severe accidents, etc.							5		7
21	BE0090	Seismic protection	1	1	1	1	1	0	2	1	4
22	BE0100	Tsunami protection									0
23	BR0010	Radiation exposure control	3	3	4	8	2	1	8	8	15
24	BR0070	Radioactive solid waste management	2	2	1	2	1	2	1	4	3
25	BQ0010	Operation of Quality Management System (Routine)	1	1	1	1	1	1	1	1	1
26		Operation of Quality Management System (Semi-annual)	1	1	1	1	1	1	4	5	3
27	BQ0040	Performance Indicator Verification	0	0	0	0	0	0	0	0	0
28	BQ0050	Initial response to occurrence of an event	0	0	0	0	0	0	0	2	0
		Total	32	29	25	41	21	14	65	77	147

(Note) "/" in the table means there is no inspection target.

(Team inspection)

		Fiscal year, quarter	FY 2020			
			Record in first quarter	Record in second quarter	Record in third quarter	Record in fourth quarter
1	BM0010	Oversight of pre-service operator inspection		Kashiwazaki-Kariwa 7、Mihama 3、Ohi 3, 4, Takahama 2, Sendai 2	Kashiwazaki-Kariwa 7、Takahama 3, 4 Genkai 3, 4, Sendai 1, 2 JAEA Nuclear Science Research Institute	Kashiwazaki-Kariwa 6, 7 Takahama 1, 2, 3, 4 JRR-3, HTTR, JAEA's NSRI disposal station, NFI Kumatori
2	BM1050	Oversight of in-service inspection		Ohi 3 (1)	Ohi 4 (1) Takahama 1-4 (4) Ikata 3 (1), Genkai 3 (1) Sendai 1 (1), Sendai 2 (1)	Takahama 3 (1), 4 (1) Genkai 4 (1)
3	BM0100	Design control			Takahama (1) JNFL reprocessing (1)	Genkai (1) Sendai (1)
4	BO1050	Safety of replaced core (dependent on licensee's periodic inspection process)		Ohi 3 (1)	Takahama 3 (1) Genkai 3 (1) Sendai 1 (1), Sendai 2 (1) Ohi 4 (1)	Genkai 4 (1) Takahama 4 (1) Takahama 1 (1)
5	BO1070	Capability of operating personnel (simulator training)				
		Appropriateness for operation personnel test				All power plants (1)
6	BE0021	Fire protection (Triennial)		Ikata (3) Sendai (1)		Genkai (3)
7	BE0070	Evaluation of training for personnel to respond to severe accidents, etc.		Genkai (1) Sendai (1)	Mihama (2) Takahama (2) Sendai (2) Ikata (1)	Ohi (1) Ikata (1) Genkai (1)
8	BE0080	Evaluation of scenario for drills for severe accidents, etc.	Genkai (1)	Mihama (2) Sendai (2)	Kashiwazaki-Kariwa (2) Ikata (1) Takahama (2)	Ohi (1) Ikata (1) Genkai (1)
9	BR0020	Radiation exposure evaluation and personal monitoring		Kashiwazaki-Kariwa (6) Genkai (6) JAEA reprocessing (6)	Fukushima Daini (3) Hamaoka (2)	Tsuruga (1) Sendai (6)
10	BR0030	Radiation exposure ALARA activity		Kashiwazaki-Kariwa (4) Genkai (4) JAEA reprocessing (4)	Fukushima Daini (2) Hamaoka (2) Onagawa (1)	Tsuruga (1) Sendai (4)
11	BR0040	Management and reduction of radioactive material concentration in air		Kashiwazaki-Kariwa (3) JAEA reprocessing (3)	Fukushima Daini (3) Hamaoka (3) Ikata (3)	Tsuruga (3) Ohi (3), Takahama (3) Genkai (3), Sendai (3)
12	BR0050	Radioactive gas/liquid waste management		Mihama (5) Genkai (1) JAEA reprocessing (5)	Onagawa (5) Fukushima Daini (3) Hamaoka (4) Ikata (5)	Tsuruga (3) Ohi (5), Takahama (5) Genkai (4), Sendai (5)
13	BR0070	Radioactive solid waste management	Recorded in statutory confirmation of team inspections			
14	BR0080	Radiation environment monitoring program	Ikata (3)	Mihama (3) JAEA reprocessing (3)	Onagawa (3) Fukushima Daini (4) Hamaoka (3)	Tsuruga (2) Ohi (3), Takahama (3)
15	BR0090	Radiation monitoring equipment	Ikata (3)	Mihama (3) JAEA reprocessing (3)	Onagawa (3) Fukushima Daini (3) Hamaoka (3)	Tsuruga (3) Ohi (4), Takahama (3)
16	BQ0010	Operation of quality management system		Shika (1) Ikata (1) Shimane (1) Ohma (1)	Tohoku Higashidori (1) Tokai Daini (1) Hamaoka (1)	Mihama (1) Takahama (1) Sendai (1)
17	Physical protection of nuclear material		Fukushima Daini Shika Ohi Genkai Kyoto University	Tomari Tohoku Higashidori Ohma Tokai Daini Shika Mihama Shimane Monju Fugen JNFL reprocessing JNFL MOX JNFL Waste JNFL Concentration and Burial JAEA reprocessing RFS Mitsubishi Nuclear Fuel Tokai Office, Nuclear Fuel Industries GNF-J Kumatori Office, Nuclear Fuel Industries Ningyo-toge Oarai Mitsubishi Electric Kindai University NDC Rokkasho, Nuclear Material Control Center Tokai, Nuclear:	Tomari Onagawa Fukushima Daini Kashiwazaki Kariwa Hamaoka Tsuruga Fugen Ohi Takahama Shimane Ikata Genkai Sendai JAEA reprocessing GNF-J Nuclear Fuel Cycle Engineering Laboratories Nuclear Science Research Institute University of Tokyo Toshiba	Tohoku Higashidori JNFL reprocessing JNFL MOX Onagawa Tokai Daini Kashiwazaki-Kariwa Hamaoka Tsuruga Mihama Takahama Ikata Sendai Fukushima Daini NFD Oarai north Oarai south Kumatori Office, Nuclear Fuel Industries

(Note) The number in the parentheses indicates the number of samples.

(Team Inspection based on legal requirements)

[Results in the 1st quarter]: 1 case

- ➢ Confirmation of waste package (inspections of work management)
  - Japan Nuclear Fuel Limited Waste Disposal Facility (at Takahama PS)

[Results in the 2nd quarter]: 7 cases

- ➢ Confirmation of off-site transportation (inspection of fuel body management (transportation and storage))
  - Global Nuclear Fuel - Japan
  - Mihama PS
  - Ikata NPS
  - KUCA
- ➢ Confirmation of radioactivity concentration (inspections of management of radioactive waste, etc.)
  - Prototype Advanced Converter Reactor Fugen
- ➢ Confirmation of decommissioning measure completion (inspections of non-applicable users, etc.)
  - Toho Kinzoku Co., Ltd. Neyagawa Factory (non-applicable facility)
  - Kyushu University Faculty of Engineering (non-applicable facility)

[Results of the 3rd quarter]: 4 cases

- ➢ Confirmation of off-site transportation (inspections of fuel body management (transportation and storage))
  - KUCA
- ➢ Confirmation of radioactivity concentration (inspections of management of radioactive waste, etc.)
  - Ningyo-toge Environmental Engineering Center, JAEA
  - Hamaoka NPS
- ➢ Confirmation of waste package(inspections of work management)
  - Japan Nuclear Fuel Limited, Waste Disposal Facility (at Tokai Daini NPS)

[Results of the 4th quarter]: 3 cases

- ➢ Confirmation of off-site transportation (inspections of fuel body management (transportation and storage))
  - Mihama PS
- ➢ Confirmation of waste package(inspections of work management)
  - Japan Nuclear Fuel Waste Limited, Waste Disposal Facility (at Ikata NPS)
- ➢ Confirmation of decommissioning measure completion(inspections of non-applicable users, etc.)
  - National Institute of Advanced Industrial Science and Technology Tsukuba Central 2

(Facilities, etc. not subject to Article 41 of the Cabinet Order of the Reactor Regulation Act)

Site			Implementation period
No.	Location	Name	
1	Aomori	Aomori Prefecture Nuclear Power Safety Center in Aomori City	—
2	Fukushima	Fukushima Environmental Creation Center, Fukushima Branch	—
3	Ibaraki	International Research Center for Nuclear Materials Science at the Institute for Materials Research of Tohoku University	2nd quarter
4	Ibaraki	JX Nippon Mining & Metals Corp., Isohara Works	—
5	Gunma	Radia Industry Co., Ltd., Head Office Factory	3rd quarter
6	Saitama	DKK-TOA Corporation, Sayama Technical Center	3rd quarter
7	Chiba	Fujii Manufacturing Co., Ltd., Chiba Factory	2nd quarter
8	Chiba	Sumitomo Chemical Co., Ltd., Chiba Works (Sodegaura)	2nd quarter
9	Kanagawa	Central Research Institute of Electric Power Industry, Yokosuka Operation and Service Center, Materials Science Research Laboratory (CRIEPI)	2nd quarter
10	Gifu	Shibata Touki (nuclear source material)	2nd quarter
11	Gifu	COMPANY e-farm (nuclear source material)	—
12	Aichi	UACJ Corporation, Nagoya Works	3rd quarter
13	Aichi	Yamaguchi Taika Co., Ltd. (nuclear source material)	3rd quarter
14	Osaka	Mitsuwa Chemicals Co., Ltd.	3rd quarter
15	Osaka	Mitsui Chemicals, Inc., Osaka Works	3rd quarter
16	Osaka	Kinki University Atomic Energy Research Institute	3rd quarter
17	Hyogo	Kishida Chemical Co., Ltd., Mita Office	4th quarter
18	Hyogo	Matsumoto Masao Shoten, Ikuno Co., Ltd. (storage facility)	4th quarter
19	Shimane	Shimane Prefecture's Nuclear Safety Division, nuclear environment center	3rd quarter
20	Yamaguchi	Teijin Limited, Iwakuni Development Center	—
21	Ehime	Sumitomo Chemical Company, Limited, Ehime Works (Niihama)	3rd quarter
22	Ehime	Ehime Prefectural Nuclear Safety Center (ENSC)	3rd quarter
23	Saga	Genkai NPS of Kyushu Electric Power Co., Inc.	4th quarter
24	Gifu	KPC Ceramic Japan (nuclear source material)	3rd quarter
25	Gifu	Mino Ganryo Kagaku (nuclear material)	4th quarter
26	Hyogo	KONICA MINOLTA, INC., Konica Minolta Kobe Site 2	3rd quarter

(Note) "-" in the table indicates inspection is conducted as required.

(3) Comprehensive Assessment in FY2020 and Inspection Plans in FY2021

(a) Comprehensive Assessment in FY2020

Nuclear facility			Comprehensive Assessment
Hokkaido Electric Power Co., Inc.	Tomari NPS	Unit 1	①
		Unit 2	①
		Unit 3	①
Tohoku Electric Power Co., Inc.	Higashidori NPS	Unit 1	①
	Onagawa NPS	Unit 1	①
		Unit 2	②
		Unit 3	①
Tokyo Electric Power Company Holdings, Inc.	Fukushima Daini NPS	Unit 1	②
		Unit 2	②
		Unit 3	②
		Unit 4	②
	Kashiwazaki-Kariwa NPS	Unit 1	③
		Unit 2	③
		Unit 3	③
		Unit 4	③
		Unit 5	③
		Unit 6	③
		Unit 7	③
Japan Atomic Power Company	Tokai NPS	－	①
	Tokai Daini NPS	－	②
Chubu Electric Power Co., Inc.	Hamaoka NPS	Unit 1	②
		Unit 2	②
		Unit 3	②
		Unit 4	②
		Unit 5	②
Hokuriku Electric Power Company	Shika NPS	Unit 1	①
		Unit 2	①
Japan Atomic Power Company	Tsuruga NPS	Unit 1	②
		Unit 2	②
Kansai Electric Power Company	Mihama PS	Unit 1	①
		Unit 2	①
		Unit 3	②
	Ohi PS	Unit 1	①
		Unit 2	①
		Unit 3	②
		Unit 4	②
	Takahama PS	Unit 1	②
		Unit 2	②
		Unit 3	②
		Unit 4	②
Chugoku Electric Power Company	Shimane NPS	Unit 1	②
		Unit 2	②
		Unit 3	②
Shikoku Electric Power Company	Ikata NPS	Unit 1	②
		Unit 2	②
		Unit 3	②
Kyushu Electric Power Company	Genkai NPS	Unit 1	①
		Unit 2	①
		Unit 3	②
		Unit 4	②

Kyushu Electric Power Company	Sendai NPS	Unit 1	①
		Unit 2	②
Electric Power Development Co., Ltd	Oma NPS	－	④
Japan Nuclear Fuel Ltd	Reprocessing facility of the reprocessing plant		①
	Waste storage facility of the reprocessing plant		①
	Fabrication facility of the enrichment and disposal plant		①
	Waste disposal facility of the enrichment and disposal plant		①
	MOX Fuel Fabrication Facility, Reprocessing Plant		①
Nuclear Material Control Center (NMCC)	Nuclear fuel material usage facilities, Rokkasho Safeguards Center		①
	Nuclear fuel material usage facilities, Tokai Safeguards Center		①
Japan Atomic Energy Agency	Nuclear Fuel Material Usage Facility, Oarai Research and Development Institute (South Area),		①
	Designated Waste Management Facility, Oarai Research and Development Institute		①
	Nuclear Fuel Material Usage Facility, Nuclear Fuel Cycle Engineering Laboratories		①
	Waste Disposal Facility, Nuclear Science Research Institute		①
	nuclear fuel material usage facility, Nuclear Science Research Institute		①
	Nuclear Fuel Material Usage Facility, Oarai Research and Development Institute (North Area)		①
	NSRR (Nuclear Safety Research Reactor), Nuclear Science Research Institute		①
	Experimental Fast Reactor Facility (Joyo) at the JAEA's Oarai Research and Development Institute (South Area)		①
	High Temperature Engineering Test Reactor (HTTR) at the JAEA's Oarai Research and Development Institute (North Area),		①
	Transient Experiment Critical Facility (TRACY), Nuclear Science Research Institute		①
	TCA (tank-type critical assembly)		①
	JRR-3, Science Research Institute		①
	FCA (Fast Critical Assembly)		①
	Reprocessing Facility, Nuclear Fuel Cycle Engineering Laboratories		①
	Static Experiment Critical Facility (STACY)Nuclear Science Research Institute		①
	JMTR Japan Materials Testing Reactor, Oarai Research and Development Institute, (North Area)		①
	JRR-2, Nuclear Science Research Institute		①
	JRR-4 Nuclear Science Research Institute		①
	DCA Deuterium Critical Assembly, Oarai Research and Development Institute (South Area)		①
	Prototype Advanced Converter Reactor Fugen		①
	Prototype Fast Breeder Monju		①
	Nuclear Fuel Material Usage Facility, Ningyo-toge Environmental Engineering Center		①
	Uranium fuel Fabrication Facility, Ningyo-toge Environmental Engineering Center		①
	The First Nuclear Ship Reactor Facilities, Aomori Research and Development Center		①
Nuclear Fuel Material Usage Facility, Nippon Nuclear Fuel Development Co. Ltd (NFD)			①
Fabrication Facility, Mitsubishi Nuclear Fuel Co., Ltd.			①
Nuclear Fuel Material Usage Facility, Nuclear Development Corporation			①
University of Tokyo Reactor (Yayoi) Nuclear Professional School, The University of Tokyo			①
Gotoh Educational Corporation, Tokyo City University Atomic Energy Research Laboratory			①
Hitachi Limited, Ozenji Center HTR (Hitachi Training Reactor)			①
Toshiba Energy Systems & Solutions Corporation	TTR-1		①
	Nuclear Engineering Laboratory, nuclear fuel material usage facilities N28-2		①
	Toshiba Nuclear Critical Assembly (NCA). Nuclear Engineering Laboratory		①
Fabrication Facility, Global Nuclear Fuel-Japan Co., Ltd.			①
Nuclear and Radiation Physics Laboratory, Rikkyo University			①
Kindai University Atomic Energy Research Institute			①
Kyoto University	Kyoto University Critical Assembly (KUCA) of Institute for Integrated Radiation and Nuclear Science		①
	Nuclear Fuel Material Usage Facility of Institute for Integrated Radiation and Nuclear Science		①

	Institute for Integrated Radiation and Nuclear Science KUR	①
Nuclear Fuel Industries, Ltd.	Tokai Works Fabrication Facility	①
	Kumatori Works Fabrication Facility	①
Nuclear Fuel Material Usage Facility of Recyclable Fuel Storage Center, Recyclable-Fuel Storage Company,		②
Nuclear Fuel Material Usage Facility in Material Analysis Building, Yokosuka Operation & Service Center, Central Research Institute of Electric Power Industry		④
Nuclear Fuel Material Usage Facility, Shibata Touki		④
Nuclear Fuel Material Usage Facility at the International Research Center for Nuclear Materials Science of the Institute for Materials Research of Tohoku University		④
Sumitomo Chemical Co., Ltd.	Nuclear Fuel Material Usage Facility, Chiba Works (Sodegaura)	④
	Nuclear Fuel Material Usage Facility, Ehime Works (Niihama)	④
Nuclear Fuel Material Usage Facility, Chiba Factory, Fujii Manufacturing Co., Ltd.		④
Nuclear Fuel Material Usage Facility, Nuclear Power Environment Center, Shimane Prefecture Nuclear Safety Measures Division		④
Nuclear Fuel Material Usage Facility, KPC Ceramic Japan		④
Nuclear Fuel Material Usage Facility, Osaka Works, Mitsui Chemicals, Inc.		④
Nuclear Fuel Material Usage Facility, Yamaguchi Taika Co., Ltd.		④
Nuclear Fuel Material Usage Facility, Ehime Prefecture Nuclear Power Center		④
Nuclear Fuel Material Usage Facility, Konica Minolta Kobe Site 2, Konica Minolta, Inc.		④
Nuclear Fuel Material Usage Facility, Main Factory of Radia Industry Co., Ltd.		④
Nuclear Fuel Material Usage Facility, Nagoya Works of UACJ Corporation		④
Nuclear Fuel Material Usage Facility,		④
Nuclear Fuel Material Usage Facility, Sayama Technical Center, Mitsuwa Chemicals Co., Ltd.		④
Nuclear Fuel Material Usage Facility, Kindai University Atomic Energy Research Institute		④
Nuclear Fuel Material Usage Facility, KISHIDA CHEMICAL Co., Ltd. Mita		④
Nuclear Fuel Material Usage Facility at the Storage Facility of Matsumoto Masao Shoten in Ikuno Co., Ltd.		④
Nuclear Fuel Material Usage Facility, Genkai NPS of Kyushu Power Electric Co., Inc.		④
Nuclear Fuel Material Usage Facility, Mino Ganryo Kagaku Co., Ltd.		④

(a) Facilities with no inspection findings confirmed

No inspection findings were confirmed and the performance indicator was “green” throughout the year.

In addition, no particular problems were found in improvement activities aimed at achieving the activity target in each monitoring area.

Since the action matrix column was 1 throughout the year and the purpose of the activity in each monitoring area was satisfied, it is assessed that autonomous improvement can be expected even if performance deteriorates.

(b) Facilities with inspection findings “green, SLIV” confirmed

Inspection findings were confirmed, but the significance and severity level were “green, SLIV,” and the performance indicator was “green” throughout the year.

In addition, no particular problems were found in improvement activities aimed at achieving the activity target in each monitoring area, including corrective activities for inspection findings.

Since the action matrix column was 1 throughout the year and the purpose of the activity in each monitoring area was satisfied, it is assessed that autonomous improvement can be expected even if performance deteriorates.

(c) Kashiwazaki-Kariwa NPS of TEPCO

The significance and severity level of inspection findings confirmed in the 3rd quarter relating to the safety of nuclear facilities and radiation safety were “green, SLIV” (unit 6). The inspection finding confirmed relating to physical protection was “white, SLIII.” According to this assessment, the action matrix column was changed from 1 to 2.

The performance indicator and severity level of inspection findings confirmed in the 4th quarter relating to physical protection were “red, SLI.” Accordingly, the action matrix column was changed from 2 to 4.

Taking a series of incidents at Kashiwazaki-Kariwa NPS into account, the NRA issued an order not to transfer specified nuclear fuel materials until the action matrix returns to the normal level, column 1, at the 3rd FY2021 NRA Commission Meeting (April 14, 2021).

The performance indicator was “green” throughout the year.

The action matrix column was 2 in the 3rd quarter and 4 in the 4th quarter. It was therefore assessed that the safety and security activities carried out by the operator were in a state of long-term or serious deterioration, while the activity target in each monitoring area is satisfied.

(d) Oma NPS of Electric Power Development Co., Ltd. (under construction), facilities, etc. not subject to Article 41 of the Cabinet Order

No inspection findings were confirmed.

Also, no particular problems were found in improvement activities aimed at achieving the activity target in each monitoring area.

Since the action matrix column was 1 throughout the year and the purpose of the activity in each monitoring area was satisfied, it is assessed that autonomous improvement can be expected even if the performance deteriorates.

(b) Inspection Plans in FY2021

(Routine inspection (power reactor)) *1, *4

No	Guide No.	Inspection guide name	Sendai Units 1, 2: In operation	Genkai Unit 1, 2: Decommissioning A Unit 3, 4: In operation	Ikata Unit 1: Decommissioning B Unit 2: Decommissioning A Unit 3: In operation	Takahama Unit 1, 2: Long-term shutdown Unit 3, 4: In operation	Ohi Unit 1, 2: Decommissioning A Unit 3, 4: In operation	Mihama Unit 1, 2: Decommissioning A Unit 3: Long-term shutdown
1	BM0020	Oversight of operator's periodic inspection *2	10	12	7	12	12	3
2	BM1040	Heat sink performance	2	3	2	3	3	1
3	BM0060	Maintenance effectiveness assessments	5	5	5	5	5	1
4	BM0100	Design control	6	6	6	6	6	1
5	BM0110	Work control	4	4	4	4	4	2
6	BO0010	Surveillance testing	18	22	17	22	22	5
7	BO1020	System configuration of equipment	18	22	18	22	22	5
8	BO1030	Reactor start-up and shutdown	2	2	1	2	2	0
9	BO1040	Operability determinations and functionality assessments	20	24	19	24	24	5
10	BO0060	Nuclear fuel control (Transportation and storage)	3	4	3	4	4	1
11	BO1070	Capability of operating personnel	4	4	4	4	4	1
12	BE0010	Protection against natural disaster	4	4	4	4	4	2
13	BE0020	Fire protection	13	13	13	13	13	7
14	BE0030	Internal flood protection	3	4	3	4	4	1
15	BE0040	Maintaining of emergency response organization	1	1	1	1	1	1
16	BE0050	Emergency preparedness and maintenance	1	1	1	1	1	1
17	BE0060	Maintaining personal capacity to respond to severe accidents, etc.	10	10	10	10	10	0
18	BE0090	Seismic protection	4	4	4	4	4	1
19	BE0100	Tsunami protection	4	4	4	4	4	1
20	BR0010	Radiation exposure control	6	6	6	6	6	5
21	BR0070	Radioactive solid waste management	3	3	3	3	3	3
22	BQ0010	Operation of Quality Management System (Routine)	1	1	1	1	1	1
23		Operation of Quality Management System (Semi-annual)	2	2	2	2	2	2
24	BQ0040	Performance Indicator Verification	1	1	1	1	1	1
25	BQ0050	Initial response to occurrence of an event	※3	※3	※3	※3	※3	※3
		Total	145	162	139	162	162	51

[Legend]
(1) "Operation": In service in compliance with new regulatory requirements.
(2) "Long-term shutdown": Long-term shutdown in preparation for compliance with new regulatory requirements
(3) "Decommissioning A": Decommissioning approved with spent fuel in SFP The same inspection is performed as in the long-term shutdown.
(4) "Decommissioning B": Decommissioning approved with no spent fuel in SFP
(5) "Decommissioning review": Under review for decommissioning the same inspection is performed as long-term shutdown.
(6) "Decommissioning planned": Planned to apply for decommissioning. The same inspection is performed as long-term shutdown.
(7) "Construction A": In the construction phase with no new fuel delivered.
(8) "Construction B": In the construction phase with new fuel delivered. The same inspection is performed as long-term shutdown
*1 Set based on the status of reactors as of March 31, 2021.
*2 The number of inspection samples for long-term shutdown and decommissioning A/B in No.1 "Supervision for Periodic Operator's Inspection" is 1/reactor.
*3 The number of samples may be increased or decreased at the discretion of the head of the regulatory office or the head of the team, in coordination with the overseeing department in charge, according to the condition of the facility or the application from the operator concerning the statutory verification action.
*4 The details of inspections and number of samples for physical protection will be adjusted and instructed separately.

No	Guide No.	Inspection guide name	Tomari Unit 3: Long-term shutdown	Higashidori Unit 1: Long-term shutdown	Onagawa Unit 1: Decommissioning A Unit 2,3: Long-term shutdown	Kashiwazaki Unit 1-7: Long-term shutdown	Fukushima Daini Unit 1-4: Decommissioning review	Tokai Unit 1: Decommissioning B Unit 2: Long-term shutdown
1	BM0020	Oversight of operator's periodic inspection *2	3	1	3	7	4	2
2	BM1040	Heat sink performance	1	1	1	2	1	1
3	BM0060	Maintenance effectiveness assessments	1	1	1	1	1	1
4	BM0100	Design control	1	1	1	1	1	1
5	BM0110	Work control	2	2	2	2	2	2
6	BO0010	Surveillance testing	5	3	5	8	6	3
7	BO1020	System configuration of equipment	5	3	5	8	6	4
8	BO1030	Reactor start-up and shutdown	0	0	0	0	0	0
9	BO1040	Operability determinations and functionality assessments	5	3	5	8	6	4
10	BO0060	Nuclear Fuel control (Transportation and storage)	1	1	1	2	1	1
11	BO1070	Capability of operating personnel	1	1	1	1	1	1
12	BE0010	Protection against natural disaster	2	2	2	2	2	2
13	BE0020	Fire protection	7	7	7	7	7	7
14	BE0030	Internal flood protection	1	1	1	2	2	1
15	BE0040	Maintaining of emergency response organization	1	1	1	1	1	1
16	BE0050	Emergency preparedness and maintenance	1	1	1	1	1	1
17	BE0060	Maintaining personal capacity to respond to severe accidents, etc.	0	0	0	0	0	0
18	BE0090	Seismic protection	1	1	1	1	1	1
19	BE0100	Tsunami protection	1	1	1	1	1	1
20	BR0010	Radiation exposure control	5	5	5	5	5	5
21	BR0070	Radioactive solid waste management	3	3	3	3	3	3
22	BQ0010	Operation of Quality Management System (Routine)	1	1	1	1	1	1
23		Operation of Quality Management System (Semi-annual)	2	2	2	2	2	2
24	BQ0040	Performance Indicator Verification	1	1	1	1	1	1
25	BQ0050	Initial response to occurrence of an event	※3	※3	※3	※3	※3	※3
		Total	51	43	51	67	56	46

[Legend]
(1) “Operation”: In service in compliance with new regulatory requirements.
(2) “Long-term shutdown”: Long-term shutdown in preparation for compliance with new regulatory requirements
(3) “Decommissioning A”: Decommissioning approved with spent fuel in SFP The same inspection is performed as in the long-term shutdown.
(4) “Decommissioning B”: Decommissioning approved with no spent fuel in SFP
(5) “Decommissioning review”: Under review for decommissioning the same inspection is performed as long-term shutdown.
(6) “Decommissioning planned”: Planned to apply for decommissioning. The same inspection is performed as long-term shutdown.
(7) “Construction A”: In the construction phase with no new fuel delivered.
(8) “Construction B”: In the construction phase with new fuel delivered. The same inspection is performed as long-term shutdown
*1 Set based on the status of reactors as of March 31, 2021.
*2 The number of inspection samples for long-term shutdown and decommissioning A/B in No.1 "Supervision for Periodic Operator's Inspection" is 1/reactor.
*3 The number of samples may be increased or decreased at the discretion of the head of the regulatory office or the head of the team, in coordination with the overseeing department in charge, according to the condition of the facility or the application from the operator concerning the statutory verification action.
*4 The details of inspections and number of samples for physical protection will be adjusted and instructed separately.

No	Guide No.	Inspection guide name	Hamaoka Unit 1, 2: Decommissioning B Unit 3-5: Long-term shutdown	Shika Unit 1,2: Long-term shutdown	Tsuruga Unit 1: Decommissioning A Unit 2: Long-term shutdown	Shimane Unit 1: Decommissioning A Unit 2: Long-term shutdown Unit 3: Construction B	Ohma Unit 1: Construction A	(TEPCO) Higashidori Unit 1: Construction A
1	BM0020	Oversight of operator's periodic inspection *2	5	2	2	3		
2	BM1040	Heat sink performance	1	1	1	1		
3	BM0060	Maintenance effectiveness assessments	1	1	1	1		
4	BM0100	Design control	1	1	1	1		
5	BM0110	Work control	2	2	2	2		
6	BO0010	Surveillance testing	5	4	4	5		
7	BO1020	System configuration of equipment	6	4	4	5		
8	BO1030	Reactor start-up and shutdown	0	0	0	0		
9	BO1040	Operability determinations and functionality assessments	6	4	4	5		
10	BO0060	Nuclear Fuel control (Transportation and storage)	1	1	1	1		
11	BO1070	Capability of operating personnel	1	1	1	1		
12	BE0010	Protection against natural disaster	2	2	2	2		
13	BE0020	Fire protection	7	7	7	7		
14	BE0030	Internal flood protection	1	1	1	1		
15	BE0040	Maintaining of emergency response organization	1	1	1	1		
16	BE0050	Emergency preparedness and maintenance	1	1	1	1		
17	BE0060	Maintaining personal capacity to respond to severe accidents, etc.	0	0	0	0		
18	BE0090	Seismic protection	1	1	1	1		
19	BE0100	Tsunami protection	1	1	1	1		
20	BR0010	Radiation exposure control	5	5	5	5		
21	BR0070	Radioactive solid waste management	3	3	3	3		
22	BQ0010	Operation of Quality Management System (Routine)	1	1	1	1		
23		Operation of Quality Management System (Semi-annual)	2	2	2	2		
24	BQ0040	Performance Indicator Verification	1	1	1	1		
25	BQ0050	Initial response to occurrence of an event	※3	※3	※3	※3		
		Total	55	47	47	51	0	0

[Legend]
(1) "Operation": In service in compliance with new regulatory requirements.
(2) "Long-term shutdown": Long-term shutdown in preparation for compliance with new regulatory requirements
(3) "Decommissioning A": Decommissioning approved with spent fuel in SFP The same inspection is performed as in the long-term shutdown.
(4) "Decommissioning B": Decommissioning approved with no spent fuel in SFP
(5) "Decommissioning review": Under review for decommissioning the same inspection is performed as long-term shutdown.
(6) "Decommissioning planned": Planned to apply for decommissioning. The same inspection is performed as long-term shutdown.
(7) "Construction A": In the construction phase with no new fuel delivered.
(8) "Construction B": In the construction phase with new fuel delivered. The same inspection is performed as long-term shutdown
*1 Set based on the status of reactors as of March 31, 2021.
*2 The number of inspection samples for long-term shutdown and decommissioning A/B in No.1 "Supervision for Periodic Operator's Inspection" is 1/reactor.
*3 The number of samples may be increased or decreased at the discretion of the head of the regulatory office or the head of the team, in coordination with the overseeing department in charge, according to the condition of the facility or the application from the operator concerning the statutory verification action.
*4 The details of inspections and number of samples for physical protection will be adjusted and instructed separately.

(Routine inspection (nuclear fuel cycle facilities, etc.))

No	Guide No.	Inspection guide name	Responcessing	Fabrication						Management and burial
										JNFL
			JNFL Rokkasho Reprocessing Facility	Global Nuclear Fuel Japan	Kumatori Office, Nuclear Fuel Industries	Tokai Office, Nuclear Fuel Industries	Mitsubishi Nuclear Fuel	JNFL Fabrication Facility	JNFL MOX Fabrication Facility	Waste management facility
1	BM0020	Oversight of operator's periodic inspection	5	6	4	4	4	4		3
2	BM1040	Heat sink performance								
3	BM0060	Maintenance effectiveness assessments	5	2	3	3	3	3		1
4	BM0100	Design control	6	-	-	-	-	3		1
5	BM0110	Work control	4	2	4	4	4	2		1
6	BO0010	Surveillance testing	14	4	4	4	4	7		1
7	BO1020	System configuration of equipment								
8	BO1030	Reactor start-up and shutdown								
9	BO1040	Operability determinations and functionality assessments								
10	BO0060	Nuclear fuel control (Transportation and storage)	2	-	-	-	-			
11	BO1070	Capability of operating personnel								
12	BO2010	Operation management	10	4	4	4	4	9		4
13	BO2020	Critical safety management	10	4	2	2	2	4		
14	BO2030	Experiment								
15	BE0010	Protection against natural disaster	4	2	2	2	2	2		1
16	BE0020	Fire protection	13	4	4	4	4	7		1
17	BE0030	Internal flood protection	2	1	1	1	1	1		1
18	BE0040	Maintaining of emergency response organization	1	1	1	1	1	1		1
19	BE0050	Emergency preparedness and maintenance	1	1	1	1	1	1		1
20	BE0060	Maintaining personal capacity to respond to severe accidents, etc.	5	5	5	5	5	5		
21	BE0090	Seismic protection	4	1	2	2	2	2		1
22	BE0100	Tsunami protection								
23	BR0010	Radiation exposure control	6	4	4	4	4	10		2
24	BR0070	Radioactive solid waste management	3	2	2	2	2	2		1
25	BQ0010	Operation of Quality Management System (Routine)	1	1	1	1	1	1	1	1
26		Operation of Quality Management System (Semi-annual)	2	2	2	2	2	2	1	1
27	BQ0040	Performance Indicator Verification	1	1	1	1	1	1	-	1
28	BQ0050	Initial response to occurrence of an event	-	-	-	-	-	-	-	-
		Total	99	47	47	47	47	67	2	23

(Note 1) "-" in the table means that the inspection is conducted as necessary.
(Note 2) "/" in the table means that there is no inspection target.
(Note 3) The number of samples may be increased or decreased at the discretion of the head of the regulatory office or the head of the team, in coordination with the overseeing department in charge, according to the condition of the facility or the application from the operator concerning the statutory verification action.

No	Guide No.	Inspection guide name	Management and burial			Storage	Use			
			JNFL	Japan Atomic Energy Agency						
			Waste Disposal Facility	Nuclear Science Research Institute (Waste Disposal Facility)	Oarai Research and Development Institute (Specified Radioactive Waste Interim Storage Facility)	Recyclable-Fuel Storage Center	Rokkasho Safeguards Center	Tokai Safeguards Center	Nippon Nuclear Fuel Development (NFD)	Nuclear Development (NDC)
1	BM0020	Oversight of operator's periodic inspection			3	-				
2	BM1040	Heat sink performance				-				
3	BM0060	Maintenance effectiveness assessments	1	-	1	-	1	1	1	1
4	BM0100	Design control	1	-	1	-	1	1	1	1
5	BM0110	Work control	1	3	1	-	1	1	1	1
6	BO0010	Surveillance testing			1		1	1	1	1
7	BO1020	System configuration of equipment								
8	BO1030	Reactor start-up and shutdown								
9	BO1040	Operability determinations and functionality assessments								
10	BO0060	Nuclear fuel control (Transportation and storage)				-			1	1
11	BO1070	Capability of operating personnel								
12	BO2010	Operation management	3	-	3		2	3	2	2
13	BO2020	Critical safety management			1		1	1	1	1
14	BO2030	Experiment								
15	BE0010	Protection against natural disaster	1	-	1	-	1	1	1	1
16	BE0020	Fire protection	1	-	1	-	1	1	1	1
17	BE0030	Internal flood protection	1	-	1	-	1	1	1	1
18	BE0040	Maintaining of emergency response organization	1	-	1	-	1	1	1	1
19	BE0050	Emergency preparedness and maintenance	1	-	1	-	1	1	1	1
20	BE0060	Maintaining personal capacity to respond to severe accidents, etc.								
21	BE0090	Seismic protection	1	-	1	-	1	1	1	1
22	BE0100	Tsunami protection								
23	BR0010	Radiation exposure control	1		2	-	2	2	2	2
24	BR0070	Radioactive solid waste management	1	-	1	-	1	1	1	1
25	BQ0010	Operation of Quality Management System (Routine)	1	-	1	1	1	1	1	1
26		Operation of Quality Management System (Semi-annual)	1	-	1	1	1	1	1	1
27	BQ0040	Performance Indicator Verification	1	-	1	-	1	1	1	1
28	BQ0050	Initial response to occurrence of an event	-	-	-	-	-	-	-	-
		Total	17	3	23	2	19	20	20	20

(Note 1) "-" in the table means that the inspection is conducted as necessary.
(Note 2) "/" in the table means that there is no inspection target.
(Note 3) The number of samples may be increased or decreased at the discretion of the head of the regulatory office or the head of the team, in coordination with the overseeing department in charge, according to the condition of the facility or the application from the operator concerning the statutory verification action.

No	Guide No.	Inspection guide name	Use							Testing reactor
			Nuclear Fuel Cycle Engineering Laboratories, JAEA	Nuclear Science Research Institute, JAEA	Oarai Research and Development Institute, JAEA (south)	Oarai Research and Development Institute, JAEA (north)	Toshiba Nuclear Engineering Laboratory	Special Nuclear Fuel Storage Room, Institute for Integrated Radiati and Nuclear Science, Kyoto University	Ningyo-toge Environmental Engineering Center, JAEA	Toshiba Nuclear Critical Assembly (NCA) (decommissioning planned)
1	BM0020	Oversight of operator's periodic inspection								4
2	BM1040	Heat sink performance								
3	BM0060	Maintenance effectiveness assessments	1	1	1	1	1		1	1
4	BM0100	Design control	1	1	1	1	-		-	1
5	BM0110	Work control	1	1	1	1	1	1	2	1
6	BO0010	Surveillance testing	1	1	1	1	1	-	1	-
7	BO1020	System configuration of equipment								
8	BO1030	Reactor start-up and shutdown								
9	BO1040	Operability determinations and functionality assessments								
10	BO0060	Nuclear fuel control (Transportation and storage)	1	1	1	1	1	1	1	1
11	BO1070	Capability of operating personnel								
12	BO2010	Operation management	2	2	2	2	2		2	2
13	BO2020	Critical safety management	1	1	1	1	1	1	1	
14	BO2030	Experiment								-
15	BE0010	Protection against natural disaster	1	1	1	1	1		2	1
16	BE0020	Fire protection	1	1	1	1	1		2	1
17	BE0030	Internal flood protection	1	1	1	1	1		2	1
18	BE0040	Maintaining of emergency response organization	1	1	1	1	1		1	1
19	BE0050	Emergency preparedness and maintenance	1	1	1	1	1		1	1
20	BE0060	Maintaining personal capacity to respond to severe accidents, etc.								
21	BE0090	Seismic protection	1	1	1	1	1	1	2	1
22	BE0100	Tsunami protection	-							
23	BR0010	Radiation exposure control	2	2	2	2	2	2	2	2
24	BR0070	Radioactive solid waste management	1	1	1	1	1	1	4	1
25	BQ0010	Operation of Quality Management System (Routine)	1	1	1	1	1		1	1
26		Operation of Quality Management System (Semi-annual)	1	1	1	1	1		1	1
27	BQ0040	Performance Indicator Verification	1	1	1	1	1	1	1	1
28	BQ0050	Initial response to occurrence of an event	-	-	-	-	-	-	-	-
		Total	20	20	20	20	19	8	27	22

(Note 1) "-" in the table means that the inspection is conducted as necessary.
(Note 2) "/" in the table means that there is no inspection target.
(Note 3) The number of samples may be increased or decreased at the discretion of the head of the regulatory office or the head of the team, in coordination with the overseeing department in charge, according to the condition of the facility or the application from the operator concerning the statutory verification action.

No	Guide No.	Inspection guide name	Testing reactor							
			Kyoto University		Atomic Energy Research Institute, Kindai University (UTR)	Nuclear Science Research Institute				Oarai Research and Development Institute (south)
			Kyoto University Critical Assembly (KUCA), Institute for Integrated Radiation and Nuclear Science	Institute for Integrated Radiation and Nuclear Science (KUR)		Fast Critical Assembly (FCA)	JRR-3 (including radioactive waste processing site)	Static Experiment Critical Facility (STACY)	Nuclear Safety Research Reactor (NSRR)	Experimental Fast Reactor (Joyo)
1	BM0020	Oversight of operator's periodic inspection	4	4	4	1	5	4	4	5
2	BM1040	Heat sink performance								
3	BM0060	Maintenance effectiveness assessments	1	3	1	1	2	1	1	1
4	BM0100	Design control	1	1	1	-	2	1	-	1
5	BM0110	Work control	1	2	1	1	6	2	2	1
6	BO0010	Surveillance testing	1	4	1	-	3	1	1	4
7	BO1020	System configuration of equipment								
8	BO1030	Reactor start-up and shutdown								
9	BO1040	Operability determinations and functionality assessments								
10	BO0060	Nuclear fuel control (Transportation and storage)	2	2	1	1	1	1	1	1
11	BO1070	Capability of operating personnel								
12	BO2010	Operation management	2	10	2	-	10	-	2	5
13	BO2020	Critical safety management								
14	BO2030	Experiment	2	6	2	-	2	-	2	-
15	BE0010	Protection against natural disaster	1	1	1	1	1	1	1	1
16	BE0020	Fire protection	2	5	1	1	2	1	1	3
17	BE0030	Internal flood protection	1	1	1	-	1	1	1	1
18	BE0040	Maintaining of emergency response organization	1	1	1	1	2	1	1	1
19	BE0050	Emergency preparedness and maintenance	1	1	1	1	2	1	1	1
20	BE0060	Maintaining personal capacity to respond to severe accidents, etc.								
21	BE0090	Seismic protection	1	1	1	1	2	1	1	1
22	BE0100	Tsunami protection								
23	BR0010	Radiation exposure control	2	6	2	1	5	2	2	5
24	BR0070	Radioactive solid waste management	1	2	1	1	2	1	1	2
25	BQ0010	Operation of Quality Management System (Routine)	1	1	1	1	1	1	1	1
26		Operation of Quality Management System (Semi-annual)	1	2	1	1	2	1	1	1
27	BQ0040	Performance Indicator Verification	1	1	1	1	1	1	1	1
28	BQ0050	Initial response to occurrence of an event	-	-	-	-	-	-	-	-
		Total	27	54	25	14	52	22	25	36

(Note 1) "-" in the table means that the inspection is conducted as necessary.
(Note 2) "/" in the table means that there is no inspection target.
(Note 3) The number of samples may be increased or decreased at the discretion of the head of the regulatory office or the head of the team, in coordination with the overseeing department in charge, according to the condition of the facility or the application from the operator concerning the statutory verification action.

No	Guide No.	Inspection guide name	Testing reactor	Decommissioning measure						
			Oarai Research and Development Institute (north)						Nuclear Science Research Institute	
			High Temperature engineering Test Reactor (HTTR)	Tokai Reprocessing Plant, Nuclear Fuel Cycle Engineering Laboratories	Institute for Atomic Energy, Rikkyo University (no nuclear fuel materials in the plants, etc.)	Hitachi Training Reactor at Hitachi Ozenji Center (HTR) (no nuclear fuel materials in the plants, etc.)	Toshiba (TTR1) (no nuclear fuel materials in the plants, etc.)	Atomic Energy Research Laboratory, Tokyo City University (no nuclear fuel materials in the plants, etc.)	Transient Experiment Critical Facility (TRACY) (no nuclear fuel materials in the plants, etc.)	JRR-2 (no nuclear fuel materials in the plants, etc.)
1	BM0020	Oversight of operator's periodic inspection	8	5	2	1	1	1	1	1
2	BM1040	Heat sink performance	/	/	/	/	/	/	/	/
3	BM0060	Maintenance effectiveness assessments	1	5	-	1	1	1	1	1
4	BM0100	Design control	1	6	-	1	-	-	-	-
5	BM0110	Work control	6	6	/	/	/	/	/	1
6	BO0010	Surveillance testing	7	10	/	/	/	/	/	-
7	BO1020	System configuration of equipment	/	/	/	/	/	/	/	/
8	BO1030	Reactor start-up and shutdown	/	/	/	/	/	/	/	/
9	BO1040	Operability determinations and functionality assessments	/	/	/	/	/	/	/	/
10	BO0060	Nuclear fuel control (Transportation and storage)	1	1	/	/	/	/	/	/
11	BO1070	Capability of operating personnel	/	/	/	/	/	/	/	/
12	BO2010	Operation management	7	5	/	/	/	/	/	/
13	BO2020	Critical safety management	/	5	/	/	/	/	/	/
14	BO2030	Experiment	2	/	/	/	/	/	/	/
15	BE0010	Protection against natural disaster	1	4	/	/	/	/	/	1
16	BE0020	Fire protection	3	13	1	/	/	/	/	1
17	BE0030	Internal flood protection	1	2	/	/	/	/	/	-
18	BE0040	Maintaining of emergency response organization	1	1	/	/	/	/	/	1
19	BE0050	Emergency preparedness and maintenance	1	1	/	/	/	/	/	1
20	BE0060	Maintaining personal capacity to respond to severe accidents, etc.	/	3	/	/	/	/	/	/
21	BE0090	Seismic protection	1	4	/	/	/	/	/	1
22	BE0100	Tsunami protection	/	4	/	/	/	/	/	/
23	BR0010	Radiation exposure control	5	6	-	1	1	1	1	1
24	BR0070	Radioactive solid waste management	2	3	1	1	1	1	1	1
25	BQ0010	Operation of Quality Management System (Routine)	1	1	1	1	1	1	1	1
26		Operation of Quality Management System (Semi-annual)	2	2	/	/	/	/	/	1
27	BQ0040	Performance Indicator Verification	1	1	1	1	1	1	1	1
28	BQ0050	Initial response to occurrence of an event	-	-	-	-	-	-	-	-
		Total	52	88	6	7	6	6	6	13

(Note 1) "-" in the table means that the inspection is conducted as necessary.
(Note 2) "/" in the table means that there is no inspection target.
(Note 3) The number of samples may be increased or decreased at the discretion of the head of the regulatory office or the head of the team, in coordination with the overseeing department in charge, according to the condition of the facility or the application from the operator concerning the statutory verification action.

No	Guide No.	Inspection guide name	Decommissioning measure								
			Nuclear Science Research Institute		Oarai Research and Development Institute (south)	Oarai Research and Development Institute (north)					
			Tank-type critical assembly (TCA) (Contains nuclear fuel materials in the plants, etc.)	JRR-4 (no nuclear fuel materials in core)	Deuterium Critical Assembly (DCA) (no nuclear fuel materials in core)	Japan Materials Test Reactor (JMTR) (no nuclear fuel materials in core)	University of Tokyo Nuclear Reactor "Yayoi" (no nuclear fuel materials in core)	First Nuclear Ship's reactor (no nuclear fuel materials in the plants, etc.)	Ningyo-toge Environmental Engineering Center, JAEA (Contains nuclear fuel materials in the plants, etc.)	Prototype Advanced Converter Seactor (Fugen) (no nuclear fuel materials in core)	Prototype Fast Breeder (Monju) (Contains nuclear fuel materialsin core)
1	BM0020	Oversight of operator's periodic inspection	1	1	1	1	1	1	3	8	12
2	BM1040	Heat sink performance	/	/	/	/	/	/	/	/	2
3	BM0060	Maintenance effectiveness assessments	1	1	1	1	1	/	1	2	4
4	BM0100	Design control	-	-	-	-	-	/	2	1	2
5	BM0110	Work control	1	1	1	1	1	1	3	4	8
6	BO0010	Surveillance testing	-	-	1	1	1	-	3	2	13
7	BO1020	System configuration of equipment	/	/	/	/	/	/	/	2	4
8	BO1030	Reactor start-up and shutdown	/	/	/	/	/	/	/	/	/
9	BO1040	Operability determinations and functionality assessments	/	/	/	/	/	/	/	1	2
10	BO0060	Nuclear fuel control (Transportation and storage)	1	1	1	1	1	/	1	1	8
11	BO1070	Capability of operating personnel	/	/	/	/	/	/	/	/	2
12	BO2010	Operation management	-	/	/	2	1	/	3	/	/
13	BO2020	Critical safety management	/	/	/	/	/	/	1	/	/
14	BO2030	Experiment	-	/	/	-	/	/	/	/	/
15	BE0010	Protection against natural disaster	1	1	1	1	1	1	1	1	2
16	BE0020	Fire protection	1	1	2	2	2	1	3	4	9
17	BE0030	Internal flood protection	-	-	1	1	1	-	1	1	1
18	BE0040	Maintaining of emergency response organization	1	1	1	1	1	/	1	1	1
19	BE0050	Emergency preparedness and maintenance	1	1	1	1	1	/	1	1	1
20	BE0060	Maintaining personal capacity to respond to severe accidents, etc.	/	/	/	/	/	/	/	/	3
21	BE0090	Seismic protection	1	1	1	1	1	-	1	1	4
22	BE0100	Tsunami protection	/	/	/	/	/	/	/	/	-
23	BR0010	Radiation exposure control	1	1	2	4	2	1	2	4	6
24	BR0070	Radioactive solid waste management	1	1	1	2	1	1	2	2	3
25	BQ0010	Operation of Quality Management System (Routine)	1	1	1	1	1	1	1	1	1
26		Operation of Quality Management System (Semi-annual)	1	1	1	1	1	1	1	2	2
27	BQ0040	Performance Indicator Verification	1	1	1	1	1	1	1	1	1
28	BQ0050	Initial response to occurrence of an event	-	-	-	-	-	-	-	-	-
		Total	14	14	18	23	19	9	32	40	91

(Note 1) "-" in the table means that the inspection is conducted as necessary.
(Note 2) "/" in the table means that there is no inspection target.
(Note 3) The number of samples may be increased or decreased at the discretion of the head of the regulatory office or the head of the team, in coordination with the overseeing department in charge, according to the condition of the facility or the application from the operator concerning the statutory verification action.

(Team inspection)

No.	Guide No.	Inspection guide name	FY 2021				FY 2022		Remark
			1st quarter	2nd quarter	3rd quarter	4th quarter	1st quarter	2nd quarter	
1	BM0010	Oversight of pre-service operator inspection	(Inspection is carried out according to the pre-service operator inspection plan.)						
2	BM1050	Oversight of in-service inspection	(Inspection is carries out according to the regular operator inspection plan.)						
3	BM0100	Design control	Ohi	Ikata	Shika Tsuruga JAEA reprocessing	Hamaoka Shimane	Higashidori Mihama	Tomari Tokai Daini	
4	BO1050	Safety of replaced core	(Inspection is carried out according to the regular operator inspection plan.)						
5	BO1070	Capability of operating personnel	(Inspection is carried out according to the operator training plan.)						
6	BE0021	Fire protection (triennial)	Takahama			Ohi			
7	BE0070	Evaluation of training for personnel to respond to severe accidents, etc.	(Inspection is carried out according to the operator training plan)						
8	BE0080	Evaluation of scenario for drills for major accidents, etc.	(Inspection is carried out according to the operator training plan)						
9	BR0020	Radiation exposure evaluation and personal monitoring	Onagawa JAPC Tokai Ikata JNFL reprocessing	Tomari Ohi Takahama	Mihama Shimane	Higashidori Shika	JAPC Tokai Sendai	Fukushima Daini Kashiwazaki-Kariwa Genkai JAEA reprocessing	Japan Atomic Power Company carried out inspections at both Tokai NPS and Tokai Daini NPS.
10	BR0030	Radiation exposure ALARA activity	Onagawa JAPC Tokai Ikata JNFL reprocessing	Tomari Ohi Takahama	Mihama Shimane	Higashidori Shika	JAPC Tokai Sendai	Fukushima Daini Kashiwazaki-Kariwa Genkai JAEA reprocessing	Japan Atomic Power Company carried out inspections at both Tokai NPS and Tokai Daini NPS.
11	BR0040	Management and reduction of radioactive material in air	Onagawa JAPC Tokai JNFL reprocessing	Tomari	Mihama Shimane	Higashidori Shika	JAPC Tokai Takahama	Fukushima Daini Kashiwazaki-Kariwa JAEA reprocessing	Japan Atomic Power Company carried out inspections at both Tokai NPS and Tokai Daini NPS.
12	BR0050	Radioactive gas/liquid waste management	JAPC Tokai JNFL reprocessing	Tomari Kashiwazaki-Kariwa	Shimane	Higashidori Shika	Takahama	Fukushima Daini Mihama JAEA reprocessing	Japan Atomic Power Company carried out inspections at both Tokai NPS and Tokai Daini NPS.
13	BR0080	Radiation environment monitoring program	JAPC Tokai JNFL reprocessing	Tomari Kashiwazaki-Kariwa	Shimane Genkai Sendai	Shika Higashidori	Ikata	Mihama Fukushima Daini JAEA reprocessing	Japan Atomic Power Company carried out inspections at both Tokai NPS and Tokai Daini NPS.
14	BR0090	Radiation monitoring equipment	JAPC Tokai JNFL reprocessing	Tomari Kashiwazaki-Kariwa	Shimane Genkai Sendai	Shika Higashidori	Ikata	Mihama Fukushima Daini JAEA reprocessing	Japan Atomic Power Company carried out inspections at both Tokai NPS and Tokai Daini NPS.
15	BQ0010	Operation of quality management system	Ohi Ikata	Onagawa Genkai JNFL reprocessing	Tomari Sendai	Takahama Mihama JAEA reprocessing	Ohi Fukushima Daini	Ikata Genkai Sendai	
16	Physical protection of nuclear material		Tomari JNFL reprocessing JNFL Waste JNFL MOX JNFL Concentration and Burial Fukushima Daini Tokai Daini JAEA reprocessing Kashiwazaki-Kariwa Shika Ohi	Tomari Tohoku Higashidori JNFL reprocessing JNFL Waste JNFL MOX JNFL Concentration and Burial Ohma RFS Onagawa Fukushima Daini JAEA reprocessing Mitsubishi Nuclear Fuel	Tomari JNFL Concentration and Burial Ohma RFS Onagawa Tokai Daini Mitsubishi Nuclear Fuel Tokai Office, Nuclear Fuel Industries GNF-J Kashiwazaki-Kariwa	Tohoku Higashidori Onagawa Fukushima Daini Oarai Wast Kashiwazaki-Kariwa Hamaoka		
			Mihama Fugen Hamaoka Shimane Ikata Genkai Sendai Tokai, Nuclear Material Control Center Rokkasho, Nuclear Material Control Center Toshiba	Oarai Waste Tokai Office, Nuclear Fuel Industries GNF-J Kashiwazaki-Kariwa Tsuruga Mihama Takahama Monju Fugen Hamaoka Kumatori Office, Nuclear Fuel Industries Ningyo-toge Genkai Sendai Kyoto University NDC Mitsubishi Electric	Shika Tsuruga Ohi Takahama Monju Shimane Ikata Kumatori Office, Nuclear Fuel Industries Ningyo-toge University of Tokyo Oarai north Oarai south NFD			

(Facilities, etc. not subject to Article 41 of the Cabinet Order of the Reactor Regulation Act)

Site			Type of approval / notification			On-site inspection (usage survey) FY	Implementation period (Note 1)	Date of approval (nuclear fuel) / notification (nuclear fuel)
No	Location	Name	Usage	Storage	Disposal			
1*[1]	Aomori	Aomori Prefecture Nuclear Energy Center in Aomori City	○	○	○	FY 2004	4th quarter	Feb 8, 1990
2	Aomori	Aomori Research and Development Center, Japan Atomic Energy Agency	○	○	○	－	3rd quarter	Feb 2, 1996
3	Aomori	Enrichment and Disposal Plant, Japan Nuclear Fuel Ltd.	○	○	○	－	2nd quarter	Oct 27, 1998
4	Akita	Akita University Mineral Industry Museum of Graduate School of International Resource Sciences	○	○	－	－	3rd quarter	Apr 2, 2007
5*[1]	Fukushima	Fukushima Branch of the Fukushima Prefectural Centre for Environmental Creation	○	○	○	－	1st quarter	May 16, 1995
6*[1]	Ibaraki	JX Nippon Mining & Metals Co., Isohara Works	－	－	○	FY 2015	1st quarter	Oct 1, 2003
7	Ibaraki	Nuclear Fuel Industries, Ltd., Tokai Works	○	○	○	－	2nd quarter	Aug 18, 2016
8	Ibaraki	Nuclear Professional School, The University of Tokyo	○	○	○	－	3rd quarter	Dec 9, 2016
9	Saitama	The 3rd depot of Japan Air Self-Defense Force, Ministry of Defense	－	○	－	－	2nd quarter	Dec 10, 2013
10	Tokyo	Nihon Box Industry (nuclear source material)	○	○	－	－	2nd quarter	Jun 13, 2019
11	Kanagawa	Global Nuclear Fuel-Japan Co., Ltd.	○	○	○	－	3rd quarter	Oct 29, 1992
12	Niigata	Niigata Racecourse, Japan Racing Association (nuclear source material)	－	○	－	－	2nd quarter	Dec 21, 2016
13	Niigata	Mizunobu Tatsunori (nuclear source material)	○	○	－	－	3rd quarter	Dec 19, 2019
14	Ishikawa	Shika NPS of Hokuriku Electric Power Co., Inc.	○	○	○	FY 2010	1st quarter	Mar 18, 1991
15	Yamanashi	Japan Thoron Development Association, Yamanashi Office (nuclear source material)	－	○	－	－	3rd quarter	Jul 19, 2016
16	Gifu	Japan Atomic Energy Agency, Tono Mine (nuclear source material)	－	○	－	－	1st quarter	Sep 8, 1989

17	Gifu	Japan Atomic Energy Agency, Tono Geoscience Center (nuclear source material)	−	○	−	−	1st quarter	Feb 15, 1991
18	Gifu	Gifu Prefectural General Medical Center	−	○	−	−	4th quarter	Sep 3, 2010
19	Gifu	National Institute for Fusion Science, National Institutes of Natural Sciences of Inter-University Research Institute Corporation	○	○	−	−	3rd quarter	Jul 17, 2013
20*[1]	Gifu	e-farm (nuclear source material)	○	○	−	−	4th quarter	Sep 1, 2003
21	Kyoto	Kyoto University Faculty of Engineering, Radiation Laboratory	○	○	○	FY 2016	1st quarter	Mar 22, 1963
22	Osaka	Nuclear Fuel Industries, Ltd. Kumatori Works	−	○	○	−	2nd quarter	Aug 25, 1972
23	Osaka	MEXT time capsule burial place	○	−	−	−	1st quarter	Sep 11, 1971
24	Nara	Nara Women's University Radioisotope Comprehensive Laboratory	−	○	−	−	3rd quarter	Dec 14, 2017
25	Okayama	Japan Atomic Energy Agency, Ningyo-toge Environmental Engineering Center (nuclear source material)	○	○	○	−	2nd quarter	Aug 29, 1977
26 ※1	Yamaguchi	Tejin Limited, Iwakuni Factory	−	○	−	FY 2018	1st quarter	Mar 28, 2003
27	Ehime	Niihama Technical Junior College, National Institute of Technology	−	○	−	−	4th quarter	Apr 24, 2013
28	Fukuoka	Mitsui Mining and Smelting Co., Ltd., Miike Office	−	○	−	−	2nd quarter	Jan 18, 2019
29	Miyazaki	Asahi Kasei Corporation, Nobeoka Branch Hyuga-Hososhima 1 Plant	−	−	○	FY 2015	1st quarter	Jan 21, 1981

(Note 1) Implementation period may be moved to another quarter due to schedule adjustments。

*1 Inspections have been postponed from FY2020 to prevent the spread of COVID-19 and in response to the declaration of a state of emergency.
(The total number of users of facilities, etc. not subject to Article 41 of the Cabinet Order of the Reactor Regulation Act was 208 (as of April 2021))

(4) Inspection Findings in FY2021 (up to the 3rd Quarter)
(Nuclear Installation and Radiation Safety)

	Subject	Overview	Safety significance Severity level

First quarter	1	Inadequate functional confirmation of the ventilation and purification equipment in the emergency response room at Tokai Daini NPS	The operator found in an internal audit that proper maintenance of emergency filter unit of the ventilation and purification equipment in the emergency response room at Tokai Daini NPS had been neglected since 2011.	Green SL IV
	2	Improper installation of the smoke detector in the charging / high-pressure safety injection pump piping room at Takahama PS Unit 4	During the walkdown inspection in the charging / high-pressure safety injection pump piping room, the horizontal distance of one of smoke detectors on the ceiling was found to be 1.1 m which is shorter than the standard distance of more than 1.5 m from the air outlet of the vent.	Green SL IV
	3	Improper installation of the smoke detector on the passage to the boric acid pump room at Takahama PS Unit 3	The cable tray on the ceiling in the passage to the boric acid pump room was covered with the fireproof sheets (one hour) and the ceiling height came down by about 90 cm causing the smoke detector to be buried in a dent.	Green SL IV
	4	Inappropriate corrective actions on fuel handling equipment at Ohi PS Unit 4	When a drive air leak occurred due to age-related deterioration of the rubber O-ring in the Unit 3 refueling system in 2018, appropriate corrective action involved replacing the part containing rubber O-ring in Unit 4, which is the same model, but the part at Unit 4 was not replaced causing a similar accident in the Unit 4 refueling system in 2019	Green SL IV
	5	Incorrect selection for radiation protector (respiratory protector) at the Reprocessing Plant of Japan Nuclear Fuel Ltd.	In the inspection for radiation protection program for workers in high contaminated area within the reprocessing plant cells, the inspector found that the incorrect respiratory protector was selected in accordance with the inadequate procedure which allowed such incorrect selection for short-time work (less than one hour).	Inspection findings (no additional action) SL IV
	6	Fire event in a low-radioactive glove box at the Rokkasho Safeguards Center of Nuclear Material Control Center	A polyvinyl chloride bag containing combustible solid waste caught fire during the work to sort out waste inside the low-radioactivity glove box due to insufficient rules on the handling of reagents.	Inspection findings (no additional action) SL IV
Second quarter	7	Failure to take corrective actions to the ventilation and air conditioning system in the main control room at Onagawa NPS	Maintenance methods were not reviewed and inspections were not conducted nearly two years despite the fact that a total of five check dampers of the air-conditioning and ventilating system in the Unit 2 main control room were subject to corrective actions based on the inoperability of check dampers of the same system at Unit 3.	Green SL IV
	8	Out of service due to improper maintenance of the turbine- driven auxiliary feed pump at Mihama PS Unit 3	~~D~~During the actual injection test of the steam generator using the turbine-driven auxiliary feed pump at Unit 3 in refueling outage, the sludge accumulated in the strainer at the pump inlet causing the strainer differential pressure to increase. Consequently the pump was tripped and it was declared the pump was out of service.	Green SL IV
	9	Inappropriate management of the main valve of the water supply system for fire suppression at Takahama PS Unit 4	The main valve of the water supply system for fire suppression located on the first floor of Unit 4 intermediate building was fully closed when it should have been fully open.	Green SL IV
	10	Failure to ensure the diversity of transmission systems for the fixed radiation monitoring equipment at Takahama PS	Wireless transmission for air dose rate measurement data between radiation monitoring posts and the main control room was interrupted due to the interruption of hard-wired transmission.	Green SL IV

	11	Incorrect decision for the estimation of body contamination for internal exposure occurred in decontamination at Takahama PS Unit 4	10kcpm was counted by bioassay in the inner nose of a worker for decontamination at PWR cavity area. The operator did not confirm the nuclide ratio and estimate the risk of aspiration in spite of their procedural requirements.	.Green SL IV
	12	Inappropriate method of inspection for automatic fire alarm equipment installed in the radioactive waste cell of Nippon Nuclear Fuel Development Co., Ltd.	For the automatic fire alarm equipment installed in the radioactive waste cell, only the sounding function was checked with the test switch and the heat sensor was not tested.	“Inspection findings (no additional response)” SL IV
	13	Failure to check body surface density of radiation workers who left the first class controlled area at Global Nuclear Fuel-Japan Co., Ltd.	A body surface density check was deliberately omitted for radiation workers who left the control area. They said in interviews that they had left the control area without checking several times in the past.	“Inspection findings (no additional action)” “ SL IV (with notification)
Third quarter	14	Incorrect assembly of the valve disc in air intake damper (A) of the air-conditioning system for the main control room due to inappropriate corrective action at Kashiwazaki-Kariwa NPS Unit 6	Since the valve disc of the air intake damper (A) for the main control room had been installed at an incorrect angle, the valve stopped halfway through when operated to full open at Unit 6. Assembly of the valve disc at an incorrect angle was reported as operational experience information in the past, but it was not properly reflected.	Green SL IV
	15	Improper installation of the fire detector in the battery room (Category IV) at Kashiwazaki-Kariwa NPS Unit 7	In the long term outage, the four fire detectors (two heat detectors and two smoke detectors) were installed on the ceiling of the battery room (Category IV) and the inspector found that the horizontal distance of one of smoke detectors was less than 1.5 m from the air outlet of the vent at Kashiwazaki-Kariwa NPS Unit 7. Subsequent confirmation of fire detectors by the operator revealed that many fire detectors were needed relocation.	Green SL IV
	16	Improper installation of smoke detectors in the containment vessel penetration area at Mihama PS Unit 3	At power operation, the cable tray in the containment vessel penetration area was covered with fireproof sheets up to the ceiling and looked like a beam, and the inspector found that the smoke detector was installed about 0.2 m from the beam-like structure where more than 0.6 m was required at Mihama PS Unit 3.	Green SL IV
	17	Improper isolation of the cable system in the motor-driven auxiliary water supply pump, which requires one-hour fire resistance, at Mihama PS Unit 3	In the refueling outage, one-hour fire-resistant putty was applied between the cable tray and the conduit housing the power cable for the A-train motor-driven auxiliary water supply pump, but the inspector found improper isolation of the cable system in that fireproof putty was absent over around a 10-centimeter stretch and the internal flame-retardant sheet was exposed at Mihama PS Unit 3.	Green SL IV
	18	Inappropriate management of the fire detectors for activating sprinkler systems at Takahama PS Unit 1	Inappropriate management of fire detectors for activating sprinkler fire extinguishing equipment at Takahama PS Unit 1	Green SL IV

	19	Omission of seal for the conduit penetration area on 3-hour fire resistant wall at the B train reactor shutdown panel room outside the main control room at Takahama PS Unit 4	The inspector found that the fireproof seal was not applied to the conduit penetration area at the entrance door of the B train reactor shutdown panel room outside the main control room at Unit 4.	Green SL IV
	20	Leak of seawater from the vent valve pipe of A-circulating water pipe due to inadequate maintenance at Ohi PS Unit 3	At power operation, corrosion due to rainwater having pitted the pipe connecting A-circulating water pipe vent valve and the circulating water pipe caused a leak of seawater. The operator stopped A-circulating water pump and reduced the reactor power to about 70% to stabilize the condenser vacuum at Ohi PS Unit 3.	Green SL IV
	21	Decrease in primary coolant monitor reading due to installation of lead shielding plate at Genkai NPS Unit 3	The inspector found a decrease in the indication of chart logger for primary coolant monitor than normal operation. It was caused by the temporary lead shield for modification for cable tray around the monitor. The operator did not have an adequate work plan considering the monitor.	Green SL IV
	22	Improper installation of the fire detectors in the A train safety switch gear room and the power supply room for control rod drive mechanism at Sendai NPS Unit 1.	A survey of the status of the fire detectors installed by the operator found that the locations of the fire detectors were inappropriate and did not meet the legal requirement under the Fire Services Act regarding the distance from the wall and the air outlet of the vent.	Green SL IV
	23	Incomplete erroneous operation prevention due to inappropriate lock management for valves under lock management at Sendai NPS Unit 1	The inspector found that multiple valves subject to lock management were not locked. The locking method was inappropriate for preventing erroneous operation, or these mistakes were likely to occur.	Green SL IV
	24	Failure to ensure that all particulate matters samples were collected from the ventilation system exhaust duct at Tokai NPS	The inspector found that the shape and position of the nozzle for collecting all particulate matter samples such as those from the ventilation system exhaust duct of the fuel splitter storages (H-1, H-2) in the spent fuel cooling pond building did not ensure that all particulate matter samples were mixed evenly at Tokai NPS which was undergoing decommissioning.	Green SL IV

* The 4th quarter results will be reported in FY2022.

(Physical Protection of nuclear material)

		Subject	Overview	Safety significance Severity level
First quarter	25	Physical protection incident at Hamaoka NPS of Chubu Electric Power Co., Inc. (access control)	Inspection of personal possessions that can be used for destruction was omitted at the entrance of the restricted access areas.	Green SL IV
Third quarter	26	Physical protection incident at Onagawa NPS (entry approval)	The ID card of another person was unknowingly used to enter the perimeter protected area.	Green SL IV

* No findings in the 2nd quarter. Those at the 4th quarter will be reported in FY2022.

(c) (Assessment of Severity Level Only)

		Subject	Severity level
Second quarter	1	Failure to inspect automatic fire alarm equipment and inadequate records at Japan Nuclear Fuel Development Co., Ltd.	SL IV (with notification)
	2	Unauthorized outing of personnel responsible for response to serious accidents during night duty at Ikata NPS of Shikoku Electric Power Co., Inc.	SL IV (with notification)
Third quarter	3	An incident in the control building in which a worker was injured by hydrogen sulfide due to an inappropriate work plan at Onagawa NPS Unit 2	SL IV (without notification)

* There was no evaluation of severity level only in the 1st quarter. Those at the 4th quarter will be reported in FY2022.

2. Inspections based on Implementation Plan pertaining to TEPCO's Fukushima Daiichi NPS

(1) Inspection Plan for Implementation Plan (as of April 1, 2021)

In FY2021, the following inspection items were inspected in accordance with the "FY2021 Plan for Execution of Implementation Plan Inspection at TEPCO's Fukushima Daiichi NPS", which was prepared based on the "Basic Policy for the Inspection Plan at TEPCO's Fukushima Daiichi NPS in 2021."

Inspection type	Inspection item
Periodic Facility Inspection	・ Equipment having the required functions during the service period of the facility, which was approved and started operation under the Implementation Plan, will be inspected to ensure that the equipment is in a condition to perform the required functions as specified in the Implementation Plan. In particular, the following facilities, etc., which were selected based on the focus of the inspection, will be designated as priority items, and inspections will be conducted by attending the inspections conducted by the operators as much as possible.
	(1) Contaminated water treatment facilities, etc. (accumulated water transfer device)
	(2) Radiation control equipment, etc. (dust radiation monitor)
	(3) Radioactive liquid waste treatment facilities and related facilities (multi-nuclide removal equipment)
	(4) Temporary facility (purification unit) for the radioactive liquid waste treatment system at Units 5 and 6
	(5) Sub-drainage and other water treatment facilities (sub-drain and other purification equipment)
Operational safety inspection	(1) Decommissioning project management
	(2) Fire protection
	(3) Radiation control
	(4) Preparation for fuel removal
	(5) Radioactive waste management
	(6) Other operational safety activities
Physical protection inspections	(1) Entry of workers into protected areas, etc.
	(2) Operation of intrusion detection equipment
	(3) Periodic evaluation and improvement of protective measures
	(4) Other protective measures

(2) Inspection finding of implementation plan pertaining to TEPCO's Fukushima Daiichi NPS

		Subject	Overview	Classification of violations of implementation plan
First quarter	1	Inadequate management of rubble, etc.	Omission of surveys on rest areas in large equipment maintenance building On March 25, 2021, TEPCO reported to the NRA a leak of nuclear fuel material, etc. in the controlled area. According to the subsequent confirmation of the containers in the temporary storage area, TEPCO admitted that details of the content were unknown, and abnormalities such as corrosion of containers were observed. In places other than the temporary storage area, many containers containing rubble, etc. whose contents, storage history, etc. were unknown were confirmed.	Minor violations (monitoring)

* No inspection findings in the 2nd and 3rd quarters. Those at the 4th quarter will be reported in FY2022.

4. Status of Application and Approval/Permission for Review of Nuclear Fuel Cycle Facilities, etc.

(April 1, 2021 – March 31, 2022)

Applicant	Facility	Application date	Review Meetings (times)	On-site investigations (times)	Date of permission or approval
Japan Nuclear Fuel Ltd.	Reprocessing facility	License modification April 28, 2021 January 12, 2022 Design and construction plan[*1] December 24, 2020 Operational safety programs change January 29, 2021	14	-	Operational safety programs change May 21, 2021
	MOX fuel fabrication facility	License modification January 12, 20224 Design and construction plan[*1] December 24, 2020	13	-	
	Uranium enrichment factory	Design and construction plan December 24, 2020 August 31, 2021 Operational safety programs change August 30, 2021	3	-	Design and construction plan July 26, 2021, 2020 February 4, 2022 Operational safety programs change September 22, 2021
	Waste management facility	License modification April 28, 2021 January 12, 2022 Operational safety programs change January 29, 2021	4	-	Operational safety programs change May 21, 2021
	Waste Disposal Facility	License modification August 1, 2018 Operational safety programs change July 15, 2021	1	-	License modification July 21, 2021 Operational safety programs change September 7, 2021
Recyclable-Fuel Storage Company	Spent fuel storage facility	License modification January 20, 2022 Design and construction plan[*2] February 26, 2021 November 12, 2021	4	-	Design and construction plan August 20, 2021
Mitsubishi Nuclear Fuel	Uranium fuel fabrication facility	Design and construction plan February 22, 2021 Operational safety programs	2	-	Design and construction plan June 1, 2021

		change July 26, 2021			
Japan Atomic Energy Agency	Waste Disposal Facility	Design and construction plan September 25, 2017 February 28, 2018 December 26, 2018 Operational safety programs change March 14, 2014 November 30, 2021	4	-	Design and construction plan October 28, 2021 August 3, 2021 Operational safety programs change February 10, 2022
	JRR-3	Design and construction plan August 19, 2011	-	-	Design and construction plan April 22, 2021
	HTTR (High-temperature engineering test reactor)	Basic design change November 15, 2021 Design and construction plan March 30, 2020[*3] Operational safety programs change October 17, 2018	-	-	Design and construction plan April 8, 2021 Operational safety programs change April 16, 2021
	Radioactive Waste Treatment Facility of Nuclear Science Research Institute	Basic design change December 10, 2021 Design and construction plan January 15, 2021[*5] May 7, 2021[*6]	4	-	Design and construction plan November 25, 2021 September 22, 2021
	NSRR (Nuclear Safety Research Reactor)	Design and construction plan March 10, 2021	1	-	Design and construction plan July 13, 2021
	STACY (Static Experiment Critical Facility)	Design and construction plan December 24, 2019 July 30, 2021 Operational safety programs change March 31, 2022	2	-	Design and construction plan July 29, 2021 January 31, 2022
	Joyo (Experimental Fast Reactor Facility)	Basic design change March 30, 2017 Operational safety programs change March 30, 2017	13	-	
Nuclear Fuel Industries, Ltd	Uranium fuel fabrication facility (Tokai Works)		-	-	
	Uranium fuel fabrication facility (Kumatori Works)	Design and construction plan August 27, 2020 February 15, 2021	-	-	Design and construction plan May 24, 2021
Global Nuclear Fuel Japan	Uranium fuel fabrication facility		-	-	
Kyoto University	KUR (Kyoto University Research Reactor)	Basic design change December 14, 2021 Design and construction plan March 18, 2022	1	1	
	KUCA (Kyoto University Critical Assembly)	Basic design change May 31, 2019 Operational safety programs change January 6, 2021	5	1	Operational safety programs change April 16, 2021
Kindai University	Kindai University Nuclear Reactor				
Japan	Tokai Low	License, July 16, 2015	1	-	

Atomic Power Company	Level Waste Disposal Facility				

- There is no facility that received designation or approval of license of refining facility or Category 1 waste disposal facility as of March 31, 2022.
- The numbers of review meetings and on-site investigations represent the number of times held in FY2021.
- Several applications may be reviewed at one session of the review meeting.
- The number of on-site investigations implemented by the members of the NRA is mentioned, and that implemented only by the staff of the secretariat of the NRA is excluded.

[*1] The application for approval to change in design and construction plans that had been submitted was withdrawn on December 24, 2020 and reapplied for on the same date.

[*2] The application for approval to change in design and construction plans that had been submitted was withdrawn on February 26, 2021 and reapplied for on the same date.

[*3] The application for approval to change in design and construction plans, which was submitted on March 26, 2019, was withdrawn on March 30, 2020, and reapplied for on the same date.

[*4] The application for approval to change operational safety programs filed on November 26, 2014 was withdrawn on October 17, 2018 and a reapplication was made on the same date.

[*5] The application for approval to change in design and construction plans, which was submitted on August 29, 2018, was withdrawn on January 15, 2021, and reapplied for on the same date.

[*6] The application to approve design and construction methods filed on August 29, 2018 was withdrawn on January 15, 2018 and a reapplication was made on May 7, 2018. The application to approve design and construction methods filed on November 29, 2018 was withdrawn on May 24, 2021.

[*7] The application to approve design and construction plans filed on February 28, 2022 was withdrawn on March 11, 2022 and reapplication was made on March 18, 2022.

5. Numbers of Reviews and Checks of Nuclear Facilities

(April 1, 2021 – March 31, 2022)

(1) Status of Reviews and Checks of Commercial Power Reactors

Type of facility		No. of cases
Commercial power reactors (60 plants) (Under decommissioning procedures: 18 plants) (Specified Nuclear Facility: 6 plants)	Permission of basic design change	7
	Notification of basic design change	32
	Approval of design and construction plan	33
	Approval of change of design and construction plan	25
	Notification of design and construction plan	6
	Extension of review period concerning the notification of design and construction plan	0
	Pass in pre-service inspection	22
	Approval of operational safety programs or approval of changes	18
	Pre-service check	16
	Notification of evaluation of safety improvement	8
	Approval of extension of the operation period	0
	Approval of change of decommissioning plan	7
	Check of method and implementation system for determining assignment of responsible facility operator	0
	Approval of the trial use of reactor	5
	Approval of partial use	1
	Instruction of omission of pre-service inspection	5
	Approval of type certification or change in design of specific dual-use cask	2
Commercial power reactors in the research and development phase (Under decommissioning procedures: 2 facilities)	Permission of basic design change	0
	Notification of basic design change	0
	Approval of operational safety programs or approval of changes	4
	Approval of change of decommissioning plan	2
	Notification of minor change to decommissioning plan	1

(2) Status of Reviews and Checks of Nuclear Fuel Cycle Facilities, etc.

Type of facility		No. of cases
Processing facility (7 facilities) (Under construction: 1 facility) (Under decommissioning procedures: 1 facility)	Permission of license modification	0
	Approval of change of design and construction plan	6
	Pass in pre-service inspection	0
	Issuance of pre-use confirmation certificate	0
	Approval of change in operational safety programs	3
	Approval of decommissioning plan	0
Research reactor facility (23 facilities) (Under decommissioning procedures: 14 facilities)	Permission of basic design change	3
	Notification of basic design change	11
	Approval of a design and construction plan or approval of changes	7
	Notification of minor change in design and construction plans	2
	Pass in pre-service inspection	0
	Issuance of pre-use confirmation certificate	3
	Approval of partial use	1
	Approval of operational safety program or approval of changes	9
	Approval of decommissioning plan	2
	Approval of change of decommissioning plan	10
	Notification of minor change in decommissioning plans	5

Spent Fuel Interim Storage Facility (1 facility) (Under construction: 1 facility)	Permission of license modification	1
	Approval of design and construction plan	0
	Approval of change in operational safety programs	0
	Type certificate	1
	Type approval	1
Reprocessing facility (2 facilities) (Under decommissioning procedures: 1 facilities)	Permission of license modification	0
	Approval of design and construction plan	0
	Pass in pre-service inspection	0
	Issuance of pre-use confirmation certificate	0
	Approval of change of decommissioning plan	4
	Approval of minor change in decommissioning plans	2
	Approval of operational safety program change	2
Category 2 waste disposal facilities (2 facilities)	Permission of license modification	1
	Confirmation of waste disposal facilities	2
	Confirmation of waste package	13
	Approval of operational safety program change	2
Waste management facility (2 facilities)	Permission of license modification	0
	Pass in pre-service inspection	1
	Issuance of pre-use confirmation certificate	0
	Approval of design and construction plan	3
	Approval of operational safety program change	2
Facilities where nuclear fuel materials are used (11 facilities)	Approval of change of use	9
	Pass in facility inspection	0
	Issuance of pre-use confirmation certificate	3
	Approval of operational safety programs or approval of changes	18
	Approval of decommissioning plan	0
	Confirmation of decommissioning measure completion	0
Off-site disposal and transportation of nuclear fuel material, etc.	Confirmation of off-site disposal	0
	Packaging design approval	4
	Packaging approval	4
	Renewal of design approval period	0
	Renewal of vessel approval period	0
	Confirmation of off-site transportation	13
	Approval of measurement of active concentration of radioactive material and method of evaluation	2
	Confirmation of radioactive concentration	4

・ There is no facility that received designation or approval of business of refining facility or Category 1 waste disposal facility as of March 31, 2022

6. Status of Application and Approval of Operation Period Extension

Applicant	Targeted power reactor	Application date	Review meetings (times)	Date of approval	Date at which 40 years have elapsed after operation started
Kansai Electric Power Co., Inc.	Unit 1 of Takahama PS	April 30, 2015	-	June 20, 2016	July 7, 2016 *1
	Unit 2 of Takahama PS	April 30, 2015	-	June 20, 2016	July 7, 2016 *1
	Unit 3 of Takahama PS	November 26, 2015	-	November 16, 2016	November 30, 2016
Japan Atomic Power Company	Tokai Daini NPS	November 24, 2017	-	November 7, 2018	November 27, 2018

・ Since no plant has filed an application for operation period extension, no review meeting was held in FY2019.

*1: For commercial power reactors to which Paragraph 2 of Article 25 of Supplementary Provision of the Act for Establishment of the NRA are applied, the application period is from April 8 to July 8, 2015.

7. Status of Application and Approval of Change in Operational Safety Program concerning Aging Management

Applicant	Targeted power reactor	Application date	Review Meetings (times)	Date of approval	Date at which 30 years or 40 years elapse after operation started
Hokkaido Electric Power Co., Inc.	Unit 1 of Tomari NPS (30 years) (only maintaining cold shutdown)	June 18, 2018	-[*4]	May 27, 2019	June 22, 2019
	Unit 2 of Tomari NPS (30 years) (only maintaining cold shutdown)	March 19, 2020	-[*4]	December 8, 2020	April 12, 2021
Tohoku Electric Power Co., Inc.	Unit 1 of Onagawa NPS (30 years) (only maintaining cold shutdown)	November 6, 2013	-[*4]	May 21, 2014	June 1, 2014
TEPCO	Unit 2 of Fukushima Daini NPS (30 years) (only maintaining cold shutdown)	July 31, 2013	-[*4]	January 22, 2014	February 3, 2014
	Unit 2 of Fukushima Daini NPS (30 years) (only maintaining cold shutdown)	October 31, 2018	-[*4]	January 30, 2019	-[*2]
	Unit 3 of the Fukushima Daini NPS (30 years) (only maintaining cold shutdown)	June 20, 2014	-[*4]	June 10, 2015	June 21, 2015
	Unit 4 of Fukushima Daini NPS (30 years) (only maintaining cold shutdown)	August 23, 2016	-[*4]	August 16, 2017	August 25, 2017
	Unit 1 of Kashiwazaki-Kariwa NPS (30 years) (only maintaining cold shutdown)	September 16, 2014	-[*4]	September 14, 2015	September 18, 2015
	Unit 2 of Kashiwazaki-Kariwa NPS (30 years) (only maintaining cold shutdown)	September 26, 2019	-[*4]	August 28, 2020	September 28, 2020
	Unit 5 of Kashiwazaki-Kariwa NPS (30 years) (only maintaining cold shutdown)	April 5, 2019	-[*4]	February 27, 2020	April 10, 2020
Chubu Electric Power Co., Inc.	Unit 3 of Hamaoka NPS (30 years) (only maintaining cold shutdown)	August 25, 2016	-[*4]	August 16, 2017	August 28, 2017
Kansai Electric Power Co., Inc.	Unit 1 of Takahama PS (40 years) (only maintaining cold shutdown)	November 12, 2013	-[*4]	November 12, 2014	November 14, 2014
	Unit 3 of Takahama PS (30 years) (operation preconditioned)	January 15, 2014	-	November 18, 2015 [*3]	January 17, 2015
	Unit 4 of Takahama PS (30 years) (operation preconditioned)	June 3, 2014	-	November 18, 2015 [*3]	June 5, 2015
	Unit 2 of Takahama PS (40 years) (only maintaining cold shutdown)	November 11, 2014	-[*4]	April 8, 2015	November 14, 2015
	Unit 1 of Takahama PS (40 years) (operation preconditioned)	April 30, 2015	-	June 20, 2016	July 7, 2016[*1]
	Unit 2 of Takahama PS (40 years) (operation preconditioned)	April 30, 2015	-	June 20, 2016	July 7, 2016[*1]
	Unit 1 of Mihama PS (only maintaining cold shutdown)	September 29, 2015	-[*4]	November 17, 2015	-[*2]
	Unit 3 of Mihama PS (40 years) (operation preconditioned)	November 26, 2015	-	November 16, 2016	November 30, 2016
	Unit 3 of Ohi PS (30 years) (operation preconditioned)	December 2, 2020	2	November 24, 2021	December 18, 2021

Applicant	Targeted power reactor	Application date	Review Meetings (times)	Date of approval	Date at which 30 years or 40 years elapse after operation started
Chugoku Electric Power Co., Inc.	Unit 1 of Shimane NPS (40 years) (only maintaining cold shutdown)	September 27, 2013	-*4	February 26, 2014	March 29, 2014
	Unit 2 of Shimane NPS (30 years) (operation preconditioned)	February 7, 2018	1	-*3	February 20, 2019
Kyushu Electric Power Co., Inc.	Unit 1 of Sendai NPS (30 years) (operation preconditioned)	December 18, 2013	-	August 5, 2015*3	July 4, 2014
	Unit 1 of Genkai NPS (40 years) (only maintaining cold shutdown)	October 10, 2014	-*4	June 10, 2015	October 15, 2015
	Unit 2 of Sendai NPS (30 years) (operation preconditioned)	November 21, 2014	-	November 18, 2015	November 28, 2015
Japan Atomic Power Company	Unit 2 of Tsuruga NPS (30 years) (only maintaining cold shutdown)	February 15, 2016	-*4	February 2, 2017	February 17, 2017
	Tokai Daini NPS (40 years) (operation preconditioned)	November 24, 2017	-	November 7, 2018	November 27, 2018

・ The numbers of review meetings represent the number of times held in FY2020.

*1 For commercial power reactors to which Paragraph 2 of Article 25 of Supplementary Provision of the Act for Establishment of the NRA are applied, the application period is from April 8 to July 8, 2015.

*2 The change of the long-term maintenance management policy due to the review of technical evaluation concerning the aging degradation of reactor facilities.

*3 The review of aging management measures is implemented based on the conformity review to New Regulatory Requirements, on the basis of the policy approved in the NRA.

*4 Based on the policy approved in the NRA, the Secretariat of the NRA performs the review of the plants to which only an evaluation on the precondition of maintenance for a cold shutdown is performed and reports the results to the NRA to seek the approval. From June 11, 2015, they will be operated in accordance with the NRA Document Management Procedures (September 19, 2012) based on discussions at the NRA Commission Meeting held on June 10, 2015.

8. Status of Application and Approval of Decommissioning Plans

Type of facility	Applicant	Facility	Receipt date	Date of approval
Processing facility (1 facility)	Japan Atomic Energy Agency (JAEA)	Ningyo-toge Environmental Engineering Center	September 28, 2018	January 20, 2021
Research reactor facility (Under decommissioning procedures: 14 facilities)	Japan Atomic Energy Agency (JAEA)	Nuclear Science Research Institute JRR-2	May 12, 2006	November 6, 2006
		Nuclear Science Research Institute JRR-4	December 25, 2015	June 7, 2017
		Transient Experiment Critical Facility (TRACY), Nuclear Science Research Institute	March 31, 2015	June 7, 2017
		Tank-type critical assembly (TCA), Nuclear Science Research Institute	April 26, 2019	March 17, 2021
		Fast Critical Assembly (FCA), Nuclear Science Research Institute	March 31, 2021	September 29, 2021
		Deuterium Critical Assembly (DCA), Oarai Science Institute	May 12, 2006.	October 20, 2006
		Japan Materials Test Reactor (JMTR), Oarai Science Institute	September 18, 2019	March 17, 2021
		First Nuclear Ship “Mutsu,” Aomori Research and Development Center	March 31, 2006	October 20, 2006
	University of Tokyo	University of Tokyo Reactor (Yayoi), Nuclear Professional School, The University of Tokyo	June 29, 2012	August 24, 2012
	Rikkyo University	Rikkyo University Reactor, Institute for Atomic Energy, Rikkyo University	May 30, 2006	June 1, 2007
	Goto Educational Corporation	TCU Reactor, Atomic Energy Research Laboratory, Tokyo City University	May 30, 2006	June 5, 2007
	Hitachi Ozenji Center	Hitachi Training Reactor (HTR)	May 31, 2006	April 20, 2007
	Toshiba Nuclear Engineering Laboratory	Toshiba Nuclear Critical Assembly (NCA)	December 23, 2019	April 28, 2021
		Toshiba Training Reactor (TTR-1)	March 31, 2006	May 22, 2007
Commercial power reactors (Under decommissioning procedures: 18 facilities)	Japan Atomic Power Company	Tokai NPS	March 10, 2006	June 30, 2006
		Unit 1 of Tsuruga NPS	February 12, 2016	April 19, 2017
	Tohoku Electric Power Co., Inc.	Unit 1 of Onagawa NPS	July 29, 2019	March 18, 2020

Type of facility	Applicant	Facility	Receipt date	Date of approval
	Tokyo Electric Power Company Holdings, Inc.	Units 1, 2, 3, and 4 of Fukushima Daini NPS	May 29, 2020	April 28, 2021
	Chubu Electric Power Co., Inc.	Units 1 and 2 of Hamaoka NPS	June 1, 2009	November 18, 2009
	Kansai Electric Power Co., Inc.	Units 1 and 2 of Mihama PS	February 12, 2016	April 19, 2017
		Units 1 and 2 of Ohi PS	November 22, 2018	December 11, 2019
	Chugoku Electric Power Co., Inc.	Unit 1 of Shimane NPS	July 4, 2016	April 19, 2017
	Shikoku Electric Power Co., Inc.	Unit 1 of Ikata NPS	December 26, 2016	June 28, 2017
		Unit 2 of Ikata NPS	October 10, 2018	October 7, 2020
	Kyushu Electric Power Co., Inc.	Unit 1 of Genkai NPS	December 22, 2015	April 19, 2017
		Unit 2 of Genkai NPS	September 3, 2019	March 18, 2020
Commercial power reactors in the research and development phase (Under decommissioning procedures: 2 facilities)	Japan Atomic Energy Agency (JAEA)	Prototype Advanced Converter Reactor	November 7, 2006	February 12, 2008
		Prototype Fast Breeder Reactor Monju	December 6, 2017	March 28, 2018
Reprocessing Facility		Reprocessing Facility, Nuclear Fuel Cycle Engineering Laboratories	June 30, 2017	June 13, 2018

Reference 4 Materials related to Promotion of Safety Research and Continuous Improvement of Regulatory Requirements (related to Section 2 in Chapter 2)

1. FY2021 Safety Research

No.	Research area	Project	Period
1	External events	Research on methodological improvement for near-source seismic hazard analysis	FY2020-FY2023
2		Research on tsunami evaluation methods and source estimation of past tsunamis	FY2021-FY2024
3		Research on fault activity evaluation	FY2020-FY2023
4		Research for accumulating knowledge on large-scale volcanic eruption and related processes	FY2019-FY2023
5		Research on enhancement of fragility evaluation methods for facilities and equipment related to external events	FY2021-FY2024
6	Fire protection	Research on fire hazard analysis for protection of nuclear power stations (phase 2)	FY2021-FY2024
7	Human and organizational factors	Regulatory research for systematic analysis of human and organizational factors based on human factors engineering	FY2019-FY2021
8	Risk evaluation	Research on PRA methods and their application to safety regulation	FY2017–FY2021
9	Severe accident (LWR)	Experimental research for reducing uncertainties in important physicochemical phenomena during severe accidents	FY2020-FY2025
10		Development of simulation codes for physicochemical phenomena including large uncertainties under severe accident of LWR	FY2017–FY2022
11		Development of analysis methodologies for the containment failure and probabilistic assessment of risks associated with sever accident of LWR	FY2017–FY2022
12	Neutronic and thermal-hydraulic characteristics	Study on best-estimate thermal-hydraulic evaluation for nuclear power plants	FY2019-FY2022
13		Research on optimal evaluation methods and uncertainty evaluation methods in nuclear characterization	FY2021-FY2024
14	Nuclear fuel	Evaluation study on fuel failure impact on reactor core coolability under accident conditions	FY2019-FY2023
15	Materials and structures (including aging degradation)	Research on ultimate endurance evaluation of containments in severe accident conditions	FY2017–FY2021
16		Research on aging degradation assessment and verification using the equipment and materials used in nuclear power plants	FY2020-FY2024
17	Specified Nuclear Facilities	Development of a database and evaluation methodology for criticality of fuel debris at Fukushima Daiichi Nuclear Power Plants	FY2014–FY2024
18	Fuel cycle facilities	Research on the progress of events such as serious accidents at reprocessing plants and MOX fuel processing plants	FY2021-FY2025
19		Research on evaluation methods relating to the latest analysis techniques in the areas of transportation and storage of spent fuel	FY2020-FY2023
20	Radioactive waste disposal facilities	Research on long-term performance assessment in waste disposal	FY2021-FY2024
21	Decommissioning and clearance	Study on activity concentration evaluation for radioactive wastes	FY2021-FY2024
22	Nuclear emergency preparedness and response	Research on the review of emergency action level (EAL) considering special facilities for severe accident management, etc.	FY2021-FY2025
23	Nuclear emergency response, radiation control and regulation	Radiation Safety Research Promotion Project	FY2017-FY2021

2. Publication in Journals and List of Publications

No.	Category	Paper titles, etc.
1	Publication in journals	Hashikura, Y., et al., “Consideration on Hydrogen Embrittlement Evaluation of Explosion-bonded Joints for Fuel Reprocessing Facilities”, Maintenology, Vol. 20, No.2, pp. 107-113, 2021
2		Kabashima, H., et al., “Nuclear Regulatory Authority Experimental Program to Characterize and Understand High Energy Arcing Fault (HEAF) Phenomena: Basic Arc Test Experimental Data”, NUREG/IA-0470, Vol. 2, 2021.
3		Yamauchi, A., “Study on the relationship between fuel fragmentation during a LOCA and pellet microstructure”, Journal of Nuclear Science and Technology, Vol. 58, Issue 12, pp. 1330-1342, 2021.
4		Kojima, M., et al., “Benchmark finite element calculations for ASCET Phase III on a reinforced-concrete shear wall affected by alkali–aggregate reaction”, Journal of Advanced Concrete Technology, Vol. 19, Issue 4, pp. 280-300, 2021.
5		Shiba, S., et al., “Core Modeling and Simulation of Peach Bottom 2 Turbine Trip Test 2 Using CASMO5/TRACE/PARCS”, Nuclear Technology, Vol. 208, Issue 2, pp. 371-383, 2022.
6		Watanabe, A., et al., “Insulation Performance of Safety-Related Electrical Penetrations for Pressurized Water Reactors under Simulated Severe Accident Conditions”, IEEJ Transactions on Fundamentals and Materials, Vol. 141, Issue 10, pp. 552-559, 2021.
7		Hoseyni, SM., et al., “Metallic melt infiltration in preheated debris bed and the effect of solidification”, Nuclear Engineering and Design, Vol. 379, 111229, 2021.
8		Niisoe, T., “An iterative application of the Green’s function approach to estimate the time variation in ^{137}Cs release to the atmosphere from the Fukushima Daiichi Nuclear Power Station”, Atmospheric Environment, Vol. 254, 118380, 2021.
9		Morita, A., et al., “Algorithms of three-dimensional concrete ablation front tracking (CAFT) and crust growth”, Annals of Nuclear Energy, Vol. 158, 108297, 2021.
10		Mamada, Y., et al., “Sequence-Based Probabilistic Seismic Hazard Analysis Considering Main- and After-shocks, —Application to the Tohoku mega earthquake and its aftershocks—”, Journal of Japan Association for Earthquake Engineering, Vol. 21, No.2, pp. 1-20, 2021
11		Tajima, R., et al., “An Empirical Method for Estimating Source Vicinity Ground-Motion Levels on Hard Bedrock and Annual Exceedance Probabilities for Inland Crustal Earthquakes with Sources Difficult to Identify in Advance”, Bulletin of the Seismological Society of America, Vol.111, No.5, pp. 2408-2425, 2021.
12		Nakamura, H., et al., “Experimental evaluation of the local failure criterion and its implementation in a damage mechanics model”, International Journal of Pressure Vessels and Piping, Vol. 194, Part A. 104488, 2021.
13		Takahashi, H., et al., “Influence of extraction process on Cs isotope ratios for Fukushima Daiichi nuclear power plant accident-contaminated soil”, Journal of Radioanalytical and Nuclear Chemistry, Vol. 329, pp. 327-336, 2021.
14		Ichihara, Y., et al., “3D FEM Soil-Structure Interaction Analysis for Kashiwazaki–Kariwa Nuclear Power Plant Considering Soil Separation and Sliding”, Frontiers in Built Environment, Vol. 7, 676408, 2021.
15		Ichihara, Y. et al., “Applicability of Equivalent Linear Analysis to Reinforced Concrete Shear Walls: 3D FEM Simulation of Experiment Results of Seismic Wall Ultimate Behavior,” Transactions of the Atomic Energy Society of Japan, Vol. 21, No. 1, pp. 1-14, 2022 (in Japanese).
16		Miyawaki, M., et al., “Trench and drilling investigation of the Median Tectonic Line in Shikoku, southwest Japan: implications for fault geometry”, Earth, Planets and Space, Vol. 73, 194, 2021.

No.	Category	Paper titles, etc.
17		Yoshii, H., et al., “Screening of uranium contamination on waste surfaces using X-ray fluorescence analysis”, Spectrochimica Acta Part B: Atomic Spectroscopy, Vol. 189, 106368, 2022.
18		Yamashita, S., et al., “Size and isotopic ratio measurements of individual nanoparticles by a continuous ion-monitoring method using Faraday detectors equipped on a multi-collector-ICP-mass spectrometer”, Journal of Analytical Atomic Spectrometry, Vol. 37, pp. 178-184, 2022.
19		Ohta, Y. et.al.,” A Study on Rock Penetration Evaluation Subjected to High Speed Impact of Hard Projectiles” 48th Symposium on Rock Mechanics, pp.31-36, 2022 (in Japanese).
20		Hotta, A., et al., “Development of a horizontal two-dimensional melt spread analysis code, THERMOS-MSPREAD Part-1: Spreading models, numerical solution methods and verifications”, Nuclear Engineering and Design, Vol. 386, 111523, 2022.
21		Hotta, A., et al., “Development of a horizontal two-dimensional melt spread analysis code, THERMOS-MSPREAD Part-2: Special models and validations based on dry spreading experiments using molten oxide mixtures and prototype corium”, Nuclear Engineering and Design, Vol. 387, 111598, 2022.
22		Ohta, Y. et.al.,” An Experimental Study on the Effect of Embedded Structures on Object Impacts” 13th Symposium on Impact Problems in Civil Engineering, No.27, 2022 (in Japanese).
1	Publication of papers at international conferences	Hotta, A., et al., “Extension of Debris Bed Cooling Evaluation Code DPCOOL for Evaluating Uncertainties in Long-term Debris Coolability”, Proceedings of the RCCS-2021-OECD/NEA Specialist Workshop on Reactor core and containment cooling systems – long term management and reliability, 2021.
2		Kikuchi, W., et al., “Extension of molten jet breakup evaluation code JBREAK by improving droplet agglomeration model and validation based on DEFOR-A test”, Proceedings of the RCCS-2021-OECD/NEA Specialist Workshop on Reactor core and containment cooling systems – long term management and reliability, 2021.
3		Azuma, K., et al., “Pilot study on seismic fragility evaluation for degraded austenitic stainless steel piping using probabilistic fracture mechanics code PASCAL-SP”, Proceedings of the ASME 2021 Pressure Vessels and Piping Conference, 2021.
4		Sekine, M., et al., “RELAP5 code analyses of PKL-4 project test on PWR multiple steam generator tube rupture accident with recovery actions”, Proceedings of the 28th International Conference on Nuclear Engineering (ICONE28), 2021.
5		Ramos, M., et al., "Phoenix Human Reliability Analysis Method: Application to a Feed and Bleed Operation", Proceedings of the 2021 International Topical Meeting on Probabilistic Safety Assessment and Analysis (PSA2021), 2021.
6		Yamakawa, K., et al., “Estimation of Vibration Characteristics of Nuclear Facilities Based on Seismic Observation Records”, Proceedings of the 28th International Conference on Nuclear Engineering (ICONE28), 2021.
7		Kaneko, J., et al., “SIMULATION OF THE OECD/NEA RBHT REFLOOD OPEN BENCHMARK TEST USING TRACE AND COBRA-TF”, Proceedings of the 19th International Topical Meeting on Nuclear Reactor Thermal Hydraulics (NURETH-19), 2022.
8		Eguchi, H., et al., “DEVELOPMENT OF TRACE/FRAPTRAN-NRA COUPLED CODE AND INCORPORATION OF FFRD MODELS FOR LOCA ANALYSIS”, Proceedings of the 19th International Topical Meeting on Nuclear Reactor Thermal Hydraulics (NURETH-19), 2022.

• List of "Received two awards from the Atomic Energy Society of Japan for outstanding academic achievements in safety research" (one Paper Award from the Atomic Energy Society of Japan and one Outstanding Presentation Award at Autumn Conference from the Thermal-Hydraulic Division of the Atomic Energy Society of Japan).

No.	Name of award	Award winner
1	2021 Japan Society of Maintenology Award - Best Paper Award	Yasuaki Hashikura, Researcher, Division of Research for Reactor System Safety, Regulatory Standard and Research Department
2	Outstanding Presentation Award at Autumn Conference in FY 2021, Thermal-Hydraulics Division of the Atomic Energy Society of Japan	Wataru Kikuchi, Researcher, Division of Research for Severe Accident, Regulatory Standard and Research Department

Reference 5 Materials related to Promotion of Nuclear Security (related to Section 1 in Chapter 3)

1. Approval and Inspection for Security Plans

(April 1, 2021 – March 31, 2022)

Approvals of changes of the security plan	62 (breakdown) Uranium Fuel Fabrication Facility: 3 Research and Test Reactor: 4 Commercial Power Reactor: 36 Power Reactor in a Research and Development Phase: 5 Spent Fuel Storage Facility: 0 Reprocessing Facility: 2 Radioactive Waste Interim Storage Facility: 1 Facilities using nuclear fuel: 11
Approval of change in implementation plans	Specified Nuclear Facility: 3
Inspection of compliance with the security plan (Nuclear regulatory inspection (physical protection))	117 (breakdown) Uranium Fuel Fabrication Facility: 13 Research and Test Reactor: 6 Commercial Power Reactor: 65 Power Reactor in a Research and Development Phase: 7 Spent Fuel Storage Facility: 1 Reprocessing Facility: 9 Radioactive Waste Interim Storage Facility: 2 Facilities using nuclear fuel: 14
Inspection of compliance with the implementation plan	Specified Nuclear Facility: 5

Reference 6 Materials related to Oversight of Efforts toward the Decommissioning of Reactors at TEPCO's Fukushima Daiichi NPS (related to Section 1 in Chapter 4)

1. Approval and Inspection of the Implementation Plan for Specified Nuclear Facilities (TEPCO Fukushima Daiichi NPS)

(April 1, 2021 – March 31, 2022)

Type of Approval/Inspection	No. of cases
Approval of amendments in Implementation Plans	8
Completion of pre-service inspection	8
Approval of test use	0
Approval of partial use	0
Instruction of omission of pre-service inspection	0
Completion of welding inspection	7
Completion of welding inspection for imports	6
Completion of periodic facility inspection	1
Operational safety inspection	4

Reference 7 Materials related to Implementation and Continuous Improvement of Regulations relating to the Radioisotope Regulation Act (related to Section 2 in Chapter 5)

1. Status of Reviews and Inspections under the Radioisotope Regulation Act

(April 1, 2021 – March 31, 2022)

(1) Review

Operator	Type of permissions and notifications	No. Of cases
Permitted users (Number of offices: 2098)	Permission (approval) of use	21
	Permission (approval) for change in permission of use	232
	Notification of discontinuation of use, etc.	45
Notification users (Number of offices: 404)	Notification of use	14
	Notification of change for notification of use	50
	Notification of discontinuation of use, etc.	28
Notification users of approved devices with a certification label (Number of offices: 5064)	Notification of use of approved devices with certification label	755
	Notification of change concerning use of approved devices with certification label	722
	Notification of discontinuation of use, etc.	731
Notification sellers (Number of offices: 331)	Notification of selling business	17
	Notification of change for notification of selling business	37
	Notification of discontinuation of selling, etc.	9
Notification lessors (Number of offices: 167)	Notification of lessor business	9
	Notification of change for notification of lessor business	33
	Notification of discontinuation of leasing, etc.	1
Permitted waste management operators (Number of offices: 7)	Permission (approval) of managing waste	0
	Permission of change for managing waste	0
	Notification of discontinuation of use, etc.	0
Off-site transport of radioisotopes	Approval of a containers to be transported	3
Registered organizations (Number of registered organizations: 19)	Registration	0
	Renewal of registration	0
	Approval and notifications of operational rules	0
	Approval and notifications of change in operational rules	19

(2) Inspection

Permitted users/Notification users	On-site inspection for safety	22
	On-site inspection for security of specific radioisotopes	126
Registered organizations	On-site inspection relating to implementation status of registered organization's operation	6

Reference 8 Activities of Committees, Councils, Review Meetings, Study Teams, etc.

* Meeting records as of the end of FY2021

1. Committees and Councils
   (1) Reactor Safety Examination Committee
   (2) Nuclear Fuel Safety Examination Committee
   (3) Joint Review Meetings of the Reactor Safety Examination Committee and the Nuclear Fuel Safety Examination Committee
   (4) Radiation Council
   (5) National Research and Development Agency Council

2. Review Meetings
   (1) Review Meeting on Conformity to the New Regulatory Requirements
   (2) Review Meeting on Decommissioning of Nuclear Facilities
   (3) Review Meeting on Clearance
   (4) Review Meeting on Container for Transportation and Specified Container for Spent Fuel Facilities
   (5) Review Meeting on Type Certification, etc. of Specific Dual-Use Cask Design
   (6) Review meeting on the Implementation Plan for discharge of treated water from Advanced Liquid Processing System (ALPS) for TEPCO's Fukushima Daiichi NPS

3. Study Teams
   (1) Technical Study Team on Environmental Radiation Monitoring
   (2) Safety Oversight Team for the Tokai Reprocessing Plant
   (3) Safety Oversight Team for Prototype Fast Breeder Reactor Monju Decommission
   (4) JAEA back-end Measures Monitoring Team
   (5) Study Team for Technical Evaluation of Atomic Energy Society of Japan Standards on the Method to Determine Radioactivity Concentration of Waste subject to Mid-depth Disposal
   (6) Study Team for Technical Evaluation of Japan Electric Association Standards for Digital Safety Protection Systems
   (7) Study Team on Continuous Improvement of Safety
   (8) Study Team on Thyroid Dose Monitoring in Emergencies

4. Committees for Specific Research and Study
   (1) Committee on Oversight and Evaluation of Specified Nuclear Facilities
   (2) Committee on Accident Analysis of the Fukushima Daiichi Nuclear Power Station
   (3) Fukushima Daiichi NPS Decommissioning and Accident Investigation Liaison and Coordination Meeting
   (4) Technical Information Committee
   (5) Technical Evaluation Committees

5. Others
   (1) NRA Policy Evaluation Meeting
   (2) Meeting on NRA's Administrative Project Review for FY2021
   (3) Meeting on Hearing Opinions of Operators regarding New Regulatory Requirements
   (4) Meeting on Continuous Improvement of Safety Evaluation of Commercial Power Reactors
   (5) Public Meeting on Inspections for Commercial Power Reactor
   (6) Research Evaluation Committee and Research Results Report Meeting (Radiation Safety Regulation Research Promotion Project)
   (7) Debriefing Session of Emergency Drills by Nuclear Operators
   (8) Opinion Hearing Meeting on Volcanic Formation Mechanisms, etc.
   (9) Meeting on the Need of Applications for Approval to Change Basic Design to Incorporate Standard Response Spectrum into Regulations
   (10) Information Exchange Meeting on the Inspection Program
   (11) Public Meeting on Improvement of Legal Reports based on the Reactor Regulation Act

1. Committees and Councils

(1) Reactor Safety Examination Committee

Overview

The Reactor Safety Examination Committee (RSEC) was established to investigate and deliberate matters relating to reactor safety upon request of the NRA in accordance with the Act for Establishment of the Nuclear Regulation Authority. Taking into account the House of Councilors' resolution added to the Act for Establishment of the Nuclear Regulation Authority, the RSEC's investigations are intended to provide objective advice for the NRA's decisions, but without substitutions for such decisions. The RSEC is also expected to check the effectiveness of the regulatory activities by the NRA and advice on their activities from a scientific and technical point of view while maintaining independence from the NRA.

At the 41st FY2013 NRA Commission Meeting on February 5, 2014, the NRA adopted RSEC establishment policies based on the Act for Establishment of NRA. Based on the policy, RSEC held its first examination meeting on May 12, 2014. It has been holding RSEC meetings regularly since then.

In FY2021, the Basic Reactor Safety Subcommittee Meeting was held four times and the Earthquake and Tsunami Hazards Subcommittee Meeting once and the Volcanic Hazards Subcommittee Meeting once, respectively. The NRA received reports on the status of deliberations from the 1st RSEC Earthquake and Tsunami Hazards Subcommittee Meeting (May 18, 2021) and the 7th Basic Reactor Safety Subcommittee Meeting (May 21, 2021) at the 13th FY2021 NRA Commission Meeting (June 16, 2021), from the 8th Basic Reactor Safety Subcommittee Meeting (September 16, 2021) at the 37th FY2021 NRA Commission Meeting (October 13, 2021), and from the 10th RSEC Volcanic Hazards Subcommittee Meeting (October 1, 2021) and the 9th Basic Reactor Safety Subcommittee Meeting (January 14, 2022) at the 65th FY2021 NRA Commission Meeting (February 16, 2022).

Members of the Committee

Examination Commissioners	Uchiyama Mayuki	Professor, Department of Radiology, Jikei University School of Medicine
	Oigawa Hiroyuki	Director, Japan Atomic Energy Agency Director, Nuclear Science Research Division and Director of Safety Research and Disaster Prevention Support Division
	Ogawa Yasuo	Professor, Volcanic Fluid Research Center, Tokyo Institute of Technology Director of the Center
	Katsuta Tadahiro	Professor, School of Law, Meiji University
	Kanda Reiko	Deputy Director, Institute of Radiological Sciences, Quantum Life and Medicine, National Institutes for Quantum Science and Technology
	Kosuga Atsuko	Associate Professor, Osaka Prefecture University Graduate School of Science
	Sekimura Naoto ◎	Vice-President, The University of Tokyo Professor, Nuclear Engineering and Management, Graduate School of Engineering, The University of Tokyo
	Takada Tsuyoshi	Head, Office for Promotion of Risk-informed Applications, Sector of Nuclear Safety Research and Emergency Preparedness Japan Atomic Energy Agency
	Takahashi Makoto	Professor, Technology and Social Systems, Graduate School of Engineering, Tohoku University
	Nagai Yasuyoshi	Professor, Institute for Materials Research, Tohoku University

		Director of the affiliated International Research Center for Nuclear Materials Science
	Nakagawa Toshiko	Professor emeritus, Tokyo City University
	Nakajima Ken	Professor, Institute for Integrated Radiation and Nuclear Science, Kyoto University
	Hisada Yoshiaki	Professor, Department of Urban Design and Planning, School of Architecture, Kogakuin University
	Hohara Shinya	Associate Professor, Atomic Energy Research Institute, Kindai University
	Matsuo Akiko	Professor, Faculty of Science and Technology, Keio University
	Maruyama Yu	Deputy Director, Nuclear Safety Research Center, Sector of Nuclear Safety Research and Emergency Preparedness, Japan Atomic Energy Agency (JAEA)
	Miyake Hiroe	Associate Professor, Earthquake Research Institute, The University of Tokyo
	Miyamachi Hiroki	Professor, Research Field in Science, Science and Engineering Area, Research and Education Assembly, Kagoshima University
	Muta Hitoshi	Associate Professor, Graduate School of Science and Engineering, Tokyo City University
	Muramatsu Ken	Affiliate Professor, Faculty of Engineering, Tokyo City University
	Yamaoka Koshun	Professor, Graduate School of Environmental Studies, Nagoya University, Tokai National Higher Education and Research System
	Yoshida Hiroko	Associate Professor, Graduate School of Pharmacy, Tohoku University
	Yoshihashi Sachiko	Associate Professor, Facility for Nuclear Materials, Nagoya University, Tokai National Higher Education and Research System
	Yoneoka Yuko	Former Executive Director and Director General, Japan Accreditation Board
Temporary commissioners	Okuno Mitsuru	Professor, The Department of Earth System Science, Faculty of Science, Fukuoka University
	Takahashi Tomoyuki	Vice President, Kansai University Professor, Faculty of Societal Safety Sciences, Kansai University
	Takahashi Hiroaki	Professor, Institute of Seismology and Volcanology, Faculty of Science, Hokkaido University
	Tanioka Yuichiro	Professor, Institute of Seismology and Volcanology, Faculty of Science, Hokkaido University
	Toda Shinji	Professor, International Research Institute of Disaster Science, Tohoku University
Expert commissioners	Azuma Takashi	Senior Researcher, Active Fault Research Group, Research Institute of Earthquake and Volcano Geology, Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology
	Ueda Hideki	Senior Researcher, National Research Institute for Earth Science and Disaster Resilience Head, Volcano Observation Network Laboratory, Network Center for Earthquake, Tsunami and Volcano, National Research Institute for Earth Science and Disaster Resilience
	Tanaka Akiko	Director, Magmatic Activity Research Group, Research Institute of Earthquake and Volcano Geology, Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology

* Double circle ◎ indicates chairperson.

Members of the Subcommittee on Earthquake and Tsunami Hazards

Examination commissioners	Hisada Yoshiaki	Professor, Department of Urban Design and Planning, School of Architecture, Kogakuin University
	Yamaoka Koshun ◎	Professor, Graduate School of Environmental Studies, Nagoya University, Tokai National Higher Education and Research System
	Miyake Hiroe	Associate Professor, Earthquake Research Institute, The University of Tokyo
Temporary commissioners	Takahashi Tomoyuki	Vice President, Kansai University Professor, Faculty of Societal Safety Sciences, Kansai University
	Tanioka Yuichiro	Professor, Institute of Seismology and Volcanology, Faculty of Science, Hokkaido University
	Toda Shinji	Professor, International Research Institute of Disaster Science, Tohoku University
Expert commissioners	Azuma Takashi	Senior Researcher, Active Fault Research Group, Research Institute of Earthquake and Volcano Geology, Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology

* Double circle ◎ indicates chairperson.

Members of the Subcommittee on Volcanic Hazards

Examination commissioners	Ogawa Yasuo◎	Professor and Center Director, Volcanic Fluid Research Center, Tokyo Institute of Technology
	Miyamachi Hiroki	Professor, Research Field in Science, Science and Engineering Area, Research and Education Assembly, Kagoshima University
Temporary commissioners	Okuno Mitsuru	Professor, The Department of Earth System Science, Faculty of Science, Fukuoka University
	Takahashi Hiroaki	Professor, Institute of Seismology and Volcanology, Faculty of Science, Hokkaido University
Expert commissioners	Ueda Hideki	Senior Researcher, National Research Institute for Earth Science and Disaster Resilience Head, Volcano Observation Network Laboratory, Network Center for Earthquake, Tsunami and Volcano, National Research Institute for Earth Science and Disaster Resilience
	Tanaka Akiko	Director, Magmatic Activity Research Group, Research Institute of Earthquake and Volcano Geology, Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology

* Double circle ◎ indicates chairperson.

Members of the Subcommittee on Reactor Safety Fundamentals

Examination commissioners	Uchiyama Mayuki	Professor, Department of Radiology, Jikei University School of Medicine
	Oigawa Hiroyuki	Director, Japan Atomic Energy Agency Director, Nuclear Science Research Division and Director of Safety Research and Disaster Prevention Support Division
	Katsuta Tadahiro	Professor, School of Law, Meiji University
	Kanda Reiko	Deputy Director, Institute of Radiological Sciences, Quantum Life and Medicine, National Institutes for Quantum Science and Technology
	Kosuga Atsuko	Associate Professor, Osaka Prefecture University Graduate School of Science
	Sekimura Naoto◎	Vice-President, The University of Tokyo Professor, Nuclear Engineering and Management, Graduate School of Engineering, The University of Tokyo
	Takada Tsuyoshi	Head, Office for Promotion of Risk-informed Applications, Sector of Nuclear Safety Research and Emergency Preparedness Japan Atomic Energy Agency
	Takahashi Makoto	Professor, Technology and Social Systems, Graduate School of Engineering, Tohoku University
	Nagai Kousuke	Professor, Institute for Materials Research, Tohoku University Director of the affiliated International Research Center for Nuclear Materials Science
	Nakagawa Toshiko	Professor emeritus, Tokyo City University
	Nakajima Ken	Professor, Institute for Integrated Radiation and Nuclear Science, Kyoto University
	Hohara Shinya	Associate Professor, Atomic Energy Research Institute, Kindai University
	Matsuo Akiko	Professor, Faculty of Science and Technology, Keio University
	Maruyama Yu	Deputy Director, Nuclear Safety Research Center, Sector of Nuclear Safety Research and Emergency Preparedness, Japan Atomic Energy Agency
	Muta Hitoshi	Associate professor, Graduate School of Science and Engineering, Tokyo City University
	Muramatsu Ken	Affiliate Professor, Faculty of Engineering, Tokyo City University
	Yoshida Hiroko	Associate Professor, Graduate School of Pharmacy, Tohoku University
	Yoshihashi Sachiko	Associate Professor, Facility for Nuclear Materials, Nagoya University, Tokai National Higher Education and Research System
	Yoneoka Yuko	Former Executive Director and Director General, Japan Accreditation Board

* Double circle ◎ indicates chairperson.

(2) Nuclear Fuel Safety Examination Committee

Outlines

The Nuclear Fuel Safety Examination Committee (NFSEC) was established based on the Act for Establishment of the Nuclear Regulation Authority to investigate and deliberate matters related to nuclear fuel safety upon direction by the NRA. Taking into account the House of Councilors' resolution added to the Act for Establishment of the Nuclear Regulation Authority, the NFSEC's investigations and deliberations are intended to provide objective advice for the NRA's decisions, but without substitutions for such decisions. The NFSEC is also expected to check the effectiveness of the regulatory activities by the NRA and advice on their activities from a scientific and technical point of view while maintaining independence from the NRA.

At the 41st FY2013 NRA Commission Meeting on February 5, 2014, the NRA adopted NFSEC establishment policies based on the Act for Establishment of NRA. Based on the policy, RSEC held its first examination meeting on May 12, 2014, and has been holding NFSEC meetings regularly since then.

In FY2021, the Basic Nuclear Fuel Safety Subcommittee Meeting was held four times, the Earthquake and Tsunami Hazards Subcommittee Meeting once, and the Volcanic Hazards Subcommittee Meeting once, respectively. The NRA received reports on the status of deliberations from the 1st NFSEC Earthquake and Tsunami Hazards Subcommittee Meeting (May 18, 2021) and the 1st Basic Nuclear Fuel Safety Subcommittee Meeting (May 21, 2021) at the 13th FY2021 NRA Commission Meeting (June 16, 2021), from the 2nd Basic Nuclear Fuel Safety Subcommittee Meeting (September 16, 2021) at the 37th FY2021 NRA Commission Meeting (October 13, 2021), and from the 10th NFSEC Volcanic Hazards Subcommittee Meeting (October 1, 2021) and the 3rd Basic Nuclear Fuel Safety Subcommittee Meeting (January 14, 2022) at the 65th FY2021 NRA Commission Meeting (February 16, 2022).

Members of the Committee

Examination Commissioners	Unesaki Hironobu	Professor, Institute for Integrated Radiation and Nuclear Science, Kyoto University
	Enokida Yoichi	Professor, Graduate School of Engineering, Nagoya University, Tokai National Higher Education and Research System
	Ogawa Yasuo	Professor and Center Director, Volcanic Fluid Research Center, Tokyo Institute of Technology Director of the Center
	Katsuta Tadahiro	Professor, School of Law, Meiji University
	Kirishima Akira	Professor, Institute of Multidisciplinary Research for Advanced Materials, Tohoku University
	Kurosaki Ken	Professor, Institute for Integrated Radiation and Nuclear Science, Kyoto University
	Kosuga Atsuko	Associate Professor, Osaka Prefecture University Graduate School of Science
	Sumi Minako	Head, Radiation Oncology Department, Tokyo Metropolitan Geriatric Medical Center
	Takagi Ikuji	Professor, Graduate School of Engineering, Kyoto University

	Takada Tsuyoshi	Head, Office for Promotion of Risk-informed Applications, Sector of Nuclear Safety Research and Emergency Preparedness Japan Atomic Energy Agency
	Nakamura Takehiko	Vice Division Director of the Sector of Nuclear Safety Research and Emergency Preparedness, and Head of the Nuclear Safety Research Center, Japan Atomic Energy Agency
	Hisada Yoshiaki	Professor, Department of Urban Design and Planning, School of Architecture, Kogakuin University
	Matsuo Akiko	Professor, Faculty of Science and Technology, Keio University
	Miyake Hiroe	Associate Professor, Earthquake Research Institute, The University of Tokyo
	Miyamachi Hiroki	Professor, Research Field in Science, Science and Engineering Area, Research and Education Assembly, Kagoshima University
	Yamaoka Koshun	Professor, Graduate School of Environmental Studies, Nagoya University, Tokai National Higher Education and Research System
	Yamamoto Akio ◎	Professor, Graduate School of Engineering, Nagoya University, Tokai National Higher Education and Research System
	Yoshida Hiroko	Associate Professor, Graduate School of Pharmacy, Tohoku University
	Yoshihashi Sachiko	Associate Professor, Facility for Nuclear Materials, Nagoya University, Tokai National Higher Education and Research System
Temporary commissioners	Okuno Mitsuru	Professor, The Department of Earth System Science, Faculty of Science, Fukuoka University
	Takahashi Tomoyuki	Vice President, Kansai University Professor, Faculty of Societal Safety Sciences, Kansai University
	Takahashi Hiroaki	Professor, Institute of Seismology and Volcanology, Faculty of Science, Hokkaido University
	Tanioka Yuichiro	Professor, Institute of Seismology and Volcanology, Faculty of Science, Hokkaido University
	Toda Shinji	Professor, International Research Institute of Disaster Science, Tohoku University
Expert commissioners	Azuma Takashi	Senior Researcher, Active Fault Research Group, Research Institute of Earthquake and Volcano Geology, Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology
	Ueda Hideki	Senior Researcher, National Research Institute for Earth Science and Disaster Resilience Head, Volcano Observation Network Laboratory, Network Center for Earthquake, Tsunami and Volcano, National Research Institute for Earth Science and Disaster Resilience
	Tanaka Akiko	Director, Magmatic Activity Research Group, Research Institute of Earthquake and Volcano Geology, Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology

* Double circle ◎ indicates chairperson.

Members of the Subcommittee on Earthquake and Tsunami Hazards

Examination commissioners	Hisada Yoshiaki	Professor, Department of Urban Design and Planning, School of Architecture, Kogakuin University
	Yamaoka Koshun◎	Professor, Graduate School of Environmental Studies, Nagoya University, Tokai National Higher Education and Research System
	Miyake Hiroe	Associate Professor, Earthquake Research Institute, The University of Tokyo
Temporary commissioners	Takahashi Tomoyuki	Vice President, Kansai University Professor, Faculty of Societal Safety Sciences, Kansai University
	Tanioka Yuichiro	Professor, Institute of Seismology and Volcanology, Faculty of Science, Hokkaido University
	Toda Shinji	Professor, International Research Institute of Disaster Science, Tohoku University
Expert commissioners	Azuma Takashi	Senior Researcher, Active Fault Research Group, Research Institute of Earthquake and Volcano Geology, Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology

* Double circle ◎ indicates chairperson.

Members of the Subcommittee on Volcanic Hazards

Examination commissioners	Ogawa Yasuo ◎	Professor, Volcanic Fluid Research Center, Tokyo Institute of Technology Director of the Center
	Miyamachi Hiroki	Professor, Research Field in Science, Science and Engineering Area, Research and Education Assembly, Kagoshima University
Temporary commissioners	Okuno Mitsuru	Professor, Department of Earth System Science, Faculty of Science, Fukuoka University
	Takahashi Hiroaki	Professor, Institute of Seismology and Volcanology, Faculty of Science, Hokkaido University
Expert commissioners	Ueda Hideki	Senior Researcher, National Research Institute for Earth Science and Disaster Resilience Head, Volcano Observation Network Laboratory, Network Center for Earthquake, Tsunami and Volcano, National Research Institute for Earth Science and Disaster Resilience
	Tanaka Akiko	Director, Magmatic Activity Research Group, Research Institute of Earthquake and Volcano Geology, Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology

* Double circle ◎ indicates chairperson.

Members of the Subcommittee on Nuclear Fuel Safety Fundamentals

Examination commissioners	Unesaki Hironobu	Professor, Institute for Integrated Radiation and Nuclear Science, Kyoto University
	Enokida Yoichi	Professor, Graduate School of Engineering, Nagoya University, Tokai National Higher Education and Research System
	Katsuta Tadahiro	Professor, School of Law, Meiji University
	Kirishima Akira	Professor, Institute of Multidisciplinary Research for Advanced Materials, Tohoku University
	Kurosaki Ken	Professor, Institute for Integrated Radiation and Nuclear Science, Kyoto University
	Kosuga Atsuko	Associate Professor, Osaka Prefecture University Graduate School of Science
	Sumi Minako	Head, Radiation Oncology Department, Tokyo Metropolitan Geriatric Medical Center
	Takagi Ikuji	Professor, Graduate School of Engineering, Kyoto University
	Takada Tsuyoshi	Head, Office for Promotion of Risk-informed Applications, Sector of Nuclear Safety Research and Emergency Preparedness, Japan Atomic Energy Agency

	Nakamura Takehiko	Vice Division Director of the Sector of Nuclear Safety Research and Emergency Preparedness, and Head of the Nuclear Safety Research Center, Japan Atomic Energy Agency
	Matsuo Akiko	Professor, Faculty of Science and Technology, Keio University
	Yamamoto Akio◎	Professor, Graduate School of Engineering, Nagoya University, Tokai National Higher Education and Research System
	Yoshida Hiroko	Associate Professor, Graduate School of Pharmacy, Tohoku University
	Yoshihashi Sachiko	Associate Professor, Facility for Nuclear Materials, Nagoya University, Tokai National Higher Education and Research System

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(3) Joint Review Meetings of the Reactor Safety Examination Committee and the Nuclear Fuel Safety Examination Committee

Results of RSEC Basic Reactor Safety Subcommittee and NFSEC Basic Nuclear Fuel Safety Subcommittee Meetings

RSEC meetings	NFSEC meetings	Date	Agendas
7 Joint	1 Joint	5/21	・State of inspection implementation ・Actions taken based on information collection and analysis of accidents and troubles that occurred in Japan and overseas ・Other
8 Joint	2 Joint	9/16	・Assessment for improving the safety of nuclear power reactor facilities ・State of implementing nuclear regulatory inspections ・Actions taken based on information collection and analysis of accidents and troubles that occurred in Japan and overseas ・Other
9 Joint	3 Joint	1/14	・Nuclear regulatory inspections ・State of response following IRRS follow-up mission ・Actions taken based on information collection and analysis of accidents and troubles that occurred in Japan and overseas ・Other
10 Joint	4 Joint	3/15	・Assessment for improving the safety of nuclear power reactor facilities ・Nuclear regulatory inspections ・Actions taken based on information collection and analysis of accidents and troubles that occurred in Japan and overseas ・Other

Results of RSEC and NFSEC Earthquake and Tsunami Hazards Subcommittee Meetings

No.	Date	Agendas
1 Joint	5/18	・Surveys and reviews by the Subcommittee on Earthquake and Tsunami Hazards ・Results of analysis on knowledge about earthquake and tsunami events, etc. collected by the Secretariat of the NRA ・Other

Results of RSEC and NFSEC Volcanic Hazards Subcommittee Meeting

No.	Date	Agendas
10	10/1	・Results of information collection and analysis on knowledge about volcanic events ・Assessment by the NRA of the results of volcanic monitoring by nuclear operators ・Other

Investigations and deliberations delegated by the NRA to the Reactor Safety Examination Committee (RSEC) and the Nuclear Fuel Safety Examination Committee (NFSEC)

Items for investigation and deliberation	Subcommittee assigned
Collect and analyze worldwide information on accidents, problems and regulatory trends, deliberate on the necessity of the NRA's actions in response to such information, and provide advice. [Instruction to the RSEC/NFSEC in June 2020]	Subcommittee on Reactor Safety of RSEC Subcommittee on Nuclear Fuel Safety of NFSEC
Evaluate and advise on the status of NRA's response to the conclusions of the follow-up mission of the IRRS (IAEA's Integrated Regulatory Review Service) conducted in January 2020. [Instruction to the RSEC/NFSEC in June 2020]	Subcommittee on Reactor Safety of RSEC Subcommittee on Nuclear Fuel Safety of NFSEC
Study and deliberate on the implementation status of the new nuclear regulatory inspection system, which came into effect in April 2020, by regulatory bodies and operators, and provide advice. [Instruction to the RSEC/NFSEC in June 2020]	Subcommittee on Reactor Safety of RSEC Subcommittee on Nuclear Fuel Safety of NFSEC
Hear from operators about evaluations for improving the safety of reactor facilities for power generation conducted by the establishers of reactors for power generation under Article 43-3-29 of the Act on Regulation of Nuclear Source Materials, Nuclear Fuel Materials and Reactors, and provide advice on how to utilize such evaluations. [Instruction to the RSEC/NFSEC in June 2020]	Subcommittee on Reactor Safety of RSEC Subcommittee on Nuclear Fuel Safety of NFSEC
Study and deliberate on NRA evaluation of commercial power reactor establishers' volcano monitoring results, and provide advice. [Instruction to the RSEC in June 2020]	Subcommittee on Volcanic Hazards of RSEC
Study and deliberate on NRA evaluation of nuclear fuel cycle facility operator' volcano monitoring results, and provide advice. [Instruction to the NFSEC in September 2020]	Subcommittee on Volcanic Hazards of NFSEC
Investigate and deliberate on the necessity of regulatory responses based on the results of collecting and analyzing information related to disasters that have occurred in Japan and abroad and findings announced by government agencies, etc., concerning events such as earthquakes and tsunamis, and provide advice. [Instruction to the RSEC/NFSEC in September 2020]	Subcommittee of Earthquake and Tsunami of RSEC Subcommittee of Earthquake and Tsunami of NFSEC
Investigate and deliberate on the necessity of regulatory responses based on the results of collecting and analyzing information related to disasters that have occurred in Japan and abroad and findings announced by government agencies, etc., concerning events such as volcanoes, and provide advice. [Instruction to the RSEC/NFSEC in September 2020]	Subcommittee on Volcanic Hazards of RSEC Subcommittee on Volcanic Hazards of NFSEC

(4) Radiation Council

Overview

In FY2021, the Radiation Council held three general meetings. In those meetings, the council followed up the operation of the Amended Regulation on Prevention of Ionizing Radiation Hazards, identified as matters to be taken into consideration in the reports on reviews of the equivalent dose limit for the lens of the eye. It also revised the "Summary of the basic concepts of radiation protection," through deliberation relating to adding explanations on the clearance, reflecting the ICRP recommendations concerning radiation protection in case of a large nuclear accident, and organizing the radiation source related and personal related in dose criteria. The updated version of the "Summary of the basic concepts of radiation protection" was conveyed from the Secretariat of the NRA to related ministries and agencies.

At the 155th Radiation Council General Meeting (February 18, 2022), the following consultations on the incorporation of the IEC Standards into domestic laws and regulations, submitted from related ministries regarding technical standards for prevention of radiation hazards, were reviewed and confirmed as valid:

- Revisions to the medical x-ray equipment standards and Enforcement Regulations on the Medical Care Act
- Revisions to the Enforcement Regulations on the Veterinary Practice Act

Members of the Committee

Commissioners	Ishii Tetsuro	J-PARC Center Special Administrative personnel Japan Atomic Energy Agency
	Ohno Kazuko	Professor, Department of Radiological Technology, Faculty of Medical Science, Kyoto College of Medical Science
	Oda Keiji ○	Director, Electron Science Institute Professor Emeritus, Kobe University
	Kai Michiaki ◎	Professor, New Faculty Establishment Preparation Office, Nippon Bunri University
	Karasawa Kumiko	Professor and department head, Department of Radiation Oncology, Faculty of Medicine, Tokyo Women's Medical University
	Kanda Reiko	Deputy Director-General, National Institute of Radiological Sciences, National Institutes for Quantum Science and Technology
	Kishimoto Atsuo	Professor, Osaka University Institute for Datability Science, Director, Research Center on Ethical, Legal and Social Issues
	Takata Ayako	Professor, Department of Preventive Medicine, St. Marianna University School of Medicine
	Takada Chie	Deputy Director, Radiation Dosimetry and Instrumentation Section, Nuclear Fuel Cycle Engineering Laboratories, Sector of Nuclear Fuel, Decommissioning and Waste Management Technology Development, Japan Atomic Energy Agency
	Tanigawa Koichi	Director of Futaba Medical Center, Fukushima Prefecture and Director of Affiliated Hospital Specially Appointed Professor, Fukushima Medical University Professor Emeritus, Hiroshima University
	Nakamura Nobutaka	Director of Pharmaceutical Department, Japan Radioisotope Association
	Matsuda Naoki	Professor, Atomic Bomb Disease Institute, Nagasaki University

	Yokoyama Sumi	Associate professor, Support Center for Collaborative Research Facilities, Research Support Promotion Headquarters, Fujita Health University
	Yoshida Hiroko	Associate Professor, Radioisotope Research and Education Center, Graduate School of Pharmacy, Tohoku University

*Double circle (◎) indicates chairperson, and circle (○) indicates the deputy to the chairperson.

Meetings of the Radiation Council

No.	Date	Agendas
153	06.23	・ Selection of chairperson and nomination of deputy chairperson ・ Current status of naturally occurring radioactive materials ・ International trend of technical standards for prevention of radiation hazards ・ Summary of the basic concepts of radiation protection ・ Others
154	10.29	・ Follow-up on the revision of equivalent dose limit for the lens of the eye ・ Summary of the basic concepts of radiation protection ・ Others
155	02.18	・ Revisions to related domestic laws and regulation with the revisions to IEC (International Electrotechnical Commission) Standards (inquiry) ・ Summary of the basic concepts of radiation protection ・ Current status of naturally occurring radioactive materials ・ Others

(5) National Research and Development Agency Council

Overview

Based on the Act on General Rules for Incorporated Administrative Agencies (Act No. 103, 1999), the NRA, a competent administrator is required to hear R&D-related council's opinions regarding part of work by the National Institutes for Quantum Science and Technology (QST) and the Japan Atomic Energy Agency (JAEA) before providing them with instructions regarding their medium to long-term goals and evaluate their performance. Therefore, the NRA established the National Research and Development Agency Council on April 10, 2015 as the council for R&D.

In FY2021, subcommittee meetings of the QST were held twice to hear opinions including performance evaluation of the QST.

Furthermore, the Japan Atomic Energy Agency (JAEA) subcommittee meeting was held four times in total to hear opinions including performance assessment of the JAEA, and medium to long-term goals for the next quarter (4th quarter).

Members of the Committee

Commissioners	Kai Michiaki ○	Professor, New Faculty Establishment Preparation Office, Nippon Bunri University
	Asari Yasushi	Dean of School of Medicine, Kitasato University
	Koshizuka Seiichi ◎	Professor, School of Engineering, The University of Tokyo
	Yamanishi Hirokuni	Director, Atomic Energy Research Institute, Kindai University
	Yamamoto Akio	Professor, Graduate School of Engineering, Nagoya University, Tokai National University Corporation
	Oba Mie	Professor, Faculty of Law, Graduate School of Law, Kanagawa University

* Double circle (◎) indicates chairperson, and circle (○) indicates the deputy to the chairperson.

Members of the Subcommittees

• Subcommittee of the National Institutes for Quantum Science and Technology

Commissioner	Kai Michiaki	Professor, New Faculty Establishment Preparation Office, Nippon Bunri University
	Asari Yasushi	Dean of School of Medicine, Kitasato University
	Yamanishi Hirokuni	Director, Atomic Energy Research Institute, Kindai University

• Subcommittee of the Japan Atomic Energy Agency

Commissioner	Koshizuka Seiichi	Professor, School of Engineering, The University of Tokyo
	Yamamoto Akio	Professor, Graduate School of Engineering, Nagoya University, Tokai National University Corporation
	Oba Mie	Professor, Kanagawa University Faculty of Law, Graduate School of Law, Kanagawa University

Meetings of each subcommittee

- Subcommittee of the National Institutes for Quantum Science and Technology

No.	Date	Agenda
12	7.12	・ Appointment of Chairperson and Deputy Chairperson of Subcommittee of the National Institutes for Quantum Science and Technology ・ FY2020 performance evaluation of the National Institutes for Quantum Science and Technology (hearing from the National Institutes for Quantum Science and Technology) ・ Others
13	8.2-8.4	・ FY2020 performance evaluation of the National Institutes for Quantum Science and Technology (summary) (Documentary review)

- Subcommittee of the Japan Atomic Energy Agency

No.	Date	Agenda
14	7.26	・ Election of the Japan Atomic Energy Agency Division Chairperson and Appointment of Acting chairman Deputy Division Chairman ・ Performance in FY2020 ・ Technical support to nuclear safety regulatory administration and budget and personnel required for safety research ・ Expected business results at the end of the 3rd medium to long-term target period ・ The review policy of the organization for the formulation of the next medium to long-term goals ・ Others
15	8.5-8.6	・ Summarization of opinions on performance in FY2020 ・ Consolidation of opinions on expected performance at the end of the 3rd medium to long-term target period ・ Consolidation of opinions on the review policy of the JAEA for the formulation of the next medium to long-term goals (Documentary review)
16	11.29	・ Proposals for the next medium to long-term goals and evaluation criteria of the JAEA ・ Others
17	12.21-12.22	・ Consolidation of Opinions Concerning the Proposal for the Next Medium to Long-term Targets and Evaluation Axis of the Japan Atomic Energy Agency (Documentary review)

2. Review Meetings

(1) Review Meeting on Conformity to the New Regulatory Requirements

Overview

Based on the new regulatory requirements for nuclear power plants that took effect on July 8, 2013 and the new regulatory requirements for nuclear fuel cycle facilities, etc. that took effect on December 18, 2013, applications for permission for change in reactor installation submitted by the nuclear operators were examined. The examinations were conducted by NRA commissioners and a study team organized by the Secretariat of the NRA. In FY2021, 76 review meetings were held for the examinations of nuclear power plants including a document review and 36 meetings were held for the examinations of nuclear fuel cycle facilities, etc. Also in FY2021, two review meetings were held to examine applications for changing operational safety programs relating to the aging management countermeasures, submitted by nuclear operators.

Members of Review Meetings

- **Review Meeting on Conformity to the New Regulatory Requirements for Nuclear Power Plants**

NRA	Ishiwatari Akira	NRA Commissioner
	Yamanaka Shinsuke	NRA Commissioner
Secretariat of the NRA	Yamagata Hiroshi	Director-General for Emergency Response (attended until the 985th meeting)
	Ono Yuji	Director-General for Nuclear Regulation, Director-General's Secretariats (attended since the 988th meeting)
	Taguchi Tatsuya	Director for Nuclear Regulation (in charge of examining commercial power reactors)
	Oasada Kaoru	Director for Nuclear Regulation (in charge of examining measures against earthquake and tsunami)
	Naito Hiroyuki	Director for Regulation of Nuclear Facilities
	Koyamada Takumi	Director for Regulation of Nuclear Facilities (attended until the 986th meeting)
	Togasaki Ko	Director for Regulation of Nuclear Facilities (attended until the 995th meeting)
	Fujimori Akihiro	Nuclear Regulation Research Officer (attended until the 963rd meeting)
	Watanabe Keiichi	Director for Regulation of Nuclear Facilities (attended until the 991st meeting)
	Iwata Junichi	Nuclear Regulation Research Officer
	Shino Tomohiro	Nuclear Regulation Research Officer (attended since the 1001st meeting)
	Kawasaki Kenji	Nuclear Regulation Research Officer (attended until the 980th meeting)
	Amano Naoki	Nuclear Regulation Research Officer
	Seki Masayuki	Planning and Research Officer
	Tetsuya Saito	Planning and Research Officer (attending since the 1018th meeting)
	Iwasawa Masaru	Planning and Research Officer (attending since the 996th meeting)

- **Review Meeting on Conformity to New Regulatory Requirements for Nuclear Fuel Cycle Facilities, etc.**

NRA	Tanaka Satoru	NRA Commissioner
	Yamanaka Shinsuke	NRA Commissioner
	Ishiwatari Akira	NRA Commissioner
Secretariat of the NRA	Ono Yuji	Director-General for Nuclear Regulation, Director-General's Secretariats (attended since the 408th meeting)
	Yamagata Hiroshi	Director-General for Emergency Response (attended until the 406th meeting)
	Ichimura Tomoya	Director-General, Nuclear Regulation Department
	Oshima Toshiyuki	Director for Nuclear Regulation (in charge of examining research reactors) (attending until the 405th meeting)
	Shima Masakazu	Deputy-Director for Nuclear Regulation (attended since the 408th meeting)
	Hasegawa Kiyomitsu	Director for Nuclear Regulation (in charge of examining nuclear fuel facilities)
	Oasada Kaoru	Director for Nuclear Regulation (in charge of examining measures against earthquake and tsunami)
	Togasaki Ko	Deputy-Director for Nuclear Regulation (attending until the 405th meeting)
	Hosono Yukio	Deputy-Director for Safety Management
	Fujimori Akihiro	Nuclear Regulation Research Officer (attended since the 408th meeting)
	Sugawara Hiroyuki	Planning and Research Officer
	Iwata Junichi	Nuclear Regulation Research Officer (attended since the 421st meeting)
	Ozawa Takahiro	Nuclear Regulation Research Officer
	Ishii Toshimitsu	Planning and Research Officer
	Kosaku Yasuo	Planning and Research Officer

- **Review Meeting on Technical Evaluation of Aging Management of Nuclear Power Plants**

Secretariat of the NRA	Ono Yuji	Director-General for Nuclear Regulation, Director-General's Secretariats
	Taguchi Tatsuya	Director for Nuclear Regulation (in charge of examining commercial power reactors)
	Togasaki Ko	Deputy-Director for Nuclear Regulation

(2) Review Meeting on Decommissioning of Nuclear Facilities

Overview

Review Meetings on Decommissioning of Nuclear Facilities are held with the attendance of NRA Commissioners and NRA Secretariat staff to examine the decommissioning plans of the nuclear facilities. In FY2021, the Review Meetings were held 3 times on nuclear power plants and 4 times on nuclear fuel cycle facilities, etc.

Members of Review Meetings

• Review Meeting on Decommissioning Plan for Nuclear Power Reactor Facilities

NRA	Yamanaka Shinsuke	NRA Commissioner
Secretariat of the NRA	Ono Yuji	Director-General for Nuclear Regulation, Director-General's Secretariats
	Taguchi Tatsuya	Director for Nuclear Regulation (in charge of examining commercial power reactors)
	Togasaki Ko	Deputy-Director for Nuclear Regulation

• Review Meeting on Decommissioning Plans for Nuclear Fuel Cycle Facilities, etc.

NRA	Tanaka Satoru	NRA Commissioner
	Yamanaka Shinsuke	NRA Commissioner
Secretariat of the NRA	Yamagata Hiroshi	Director-General for Emergency Response (attending until the 23rd meeting)
	Ono Yuji	Director-General for Nuclear Regulation, Director-General's Secretariats (in charge of examining research reactors) (attending since the 24th meeting)
	Oshima Toshiyuki	Director for Nuclear Regulation (in charge of examining research reactors) (attending until the 23rd meeting)
	Shima Masakazu	Deputy-Director for Nuclear Regulation (in charge of examining research reactors) (attended since the 24th meeting)
	Hosono Yukio	Deputy-Director for Safety Management

(3) Review Meeting on Clearance

Overview

Review Meeting on the methods of measuring, and evaluating radioactive concentration in materials used in nuclear facilities are held with the attendance of a study team consisting of the NRA Secretariat staff. One review meeting for clearance was held in FY2021.

• Members of the Review Meeting on Clearance

Secretariat of the NRA	Yamagata Hiroshi	Director-General for Emergency Response
	Hasegawa Kiyomitsu	Director for Nuclear Regulation (in charge of examining nuclear fuel facilities)
	Shima Masakazu	Deputy-Director for Nuclear Regulation

(4) Review Meeting on Container for Transportation and Specified Container for Spent Fuel Facilities

Overview

Review Meeting on Container for Transportation and Specified Container for Spent Fuel Facilities are held with the attendance of a study team consisting of the NRA Secretariat staff. In FY2021, six review meetings were held.

• Members of the Review Meeting on Container for Transportation and Specified Container for Spent Fuel Facilities

Secretariat of the NRA	Yamagata Hiroshi	Director-General for Emergency Response (attending until the 6th meeting)
	Ono Yuji	Director-General for Nuclear Regulation, Director-General's Secretariats (attending since the 7th meeting)
	Hasegawa Kiyomitsu	Director for Nuclear Regulation (in charge of examining nuclear fuel facilities)
	Shima Masakazu	Nuclear fuel facilities review division (attending until the 6th meeting)
	Ishii Toshimitsu	Planning and Research Officer

(5) Review Meeting on Type Certification, etc. of Specific Dual-Use Cask Design

Overview

A system consisting of staff from NRA has been established and is holding Review Meeting on Type Certification, etc. of Specific Dual-Use Cask Design. The review meeting was held seven times in FY2021 including a document review.

Members of the Review Meeting on Type Certification, etc. of Specific Dual-Use Cask Design

Secretariat of the NRA	Yamagata Hiroshi	Director-General for Emergency Response (attending until the 9th meeting)
	Ono Yuji	Director-General for Nuclear Regulation, Director-General's Secretariats (attending since the 10th meeting)
	Taguchi Tatsuya	Director for Nuclear Regulation (in charge of examining commercial power reactors)
	Iwata Junichi	Nuclear Regulation Research Officer (attending until the 9th meeting)
	Shino Tomohiro	Nuclear Regulation Research Officer (attended since the 10th meeting)

(6) Review Meeting on Implementation Plans for Discharge of Treated Water from Advanced Liquid Processing System (ALPS), etc. at Fukushima Daiichi NPS of TEPCO

Overview

The review meeting on Implementation Plan for discharge of treated water from Advanced Liquid Processing System (ALPS), etc. at the Fukushima Daiichi NPS of TEPCO was held by creating a framework consisting of the NRA commissioners and the NRA Secretariat staff. In FY2021, the review meeting was held 13 times.

• Members of the Review Meeting for Implementation Plan for discharge of treated water from Advanced Liquid Processing System (ALPS)**, etc. at Fukushima Daiichi NPS of TEPCO**

NRA	Ban Nobuhiko	NRA Commissioner (participated in all meetings except for the 4th, 10th and 11th meetings)
Secretariat of the NRA	Kaneko Shuichi	Director-General for Emergency Response
	Takeuchi Jun	Director, Office for Accident Measures of Fukushima Daiichi Nuclear Power Station
	Shibutani Tomoki	Planning and Research Officer
	Iwanaga Kohei	Planning and Research Officer

3. Study Teams

(1) Technical Study Team on Environmental Radiation Monitoring

Overview

In order to conduct appropriate radiation monitoring during emergencies as well as during normal times, it is important to establish a technological base for monitoring, reviewing monitoring methods, and maintaining a monitoring skill. In order to continuously study monitoring technology, the Technical Study Team on Environmental Radiation Monitoring consisting of Commissioner Nobuhiko Ban and external experts was formed, under which two meetings were held in FY2021 (for more details, see Chapter 5, Section 5-6).

Members of the Study Team

NRA	Ban Nobuhiko	NRA Commissioner
External experts	Aono Tatsuo	Group Leader, Project for Environmental Dynamics and Radiation Effect, Fukushima Project Headquarter, Institute of Radiological Sciences, Quantum Life and Medical Science, National Institutes for Quantum Science and Technology
	Abe Yukio	Chief Engineer, Environmental Radiation Monitoring Centre, Centre for Environmental Creation, Fukushima Prefectural Government
	Iimoto Takeshi	Professor, Division for Environment, Health and Safety, The University of Tokyo
	Takahashi Tomoyuki	Associate Professor, Division of Nuclear Engineering Science, Institute for Integrated Radiation and Nuclear Science, Kyoto University
	Tagami Keiko	Group leader, Residential Area Nuclide Migration Study Group, Radiation Effects Research Department, Institute of Radiological Sciences, Quantum Life and Medical Science, National Institutes for Quantum Science and Technology
	Takeishi Minoru	Technical Advisor, Emergency Assistance and Training Division, Nuclear Emergency Assistance and Training Center, Sector of Safety Research and Emergency Preparedness, Japan Atomic Energy Agency
	Momose Takumaro	Deputy Director-General, Fukushima Research Institute, Sector of Fukushima Research and Development, Japan Atomic Energy Agency
	Yamazawa Hiromi	Professor, Graduate School of Engineering, Nagoya University
Secretariat of the NRA	Sato Gyo	Director-General for Emergency Response
	Murayama Ryosuke	Director, Radiation Monitoring Division
	Nitta Akira	Director, Radiation Protection Policy Planning Division
	Takemoto Akira	Director, Environmental Radioactivity Office, Radiation Monitoring Division
	Sasaki Jun	Planning Officer, Radiation Monitoring Division

(2) Safety Oversight Team for the Tokai Reprocessing Plant

Overview

Eight meetings of this oversight team, consisting of an NRA Commissioner, the NRA Secretariat staff and others, were held in FY2021 to continuously check the state of implementing measures for risk reduction such as vitrification, safety measures and decommissioning at the Tokai

reprocessing plant, Nuclear Fuel Cycle Engineering Laboratories, Japan Atomic Energy Agency (JAEA).

Members of the Study Team

NRA	Tanaka Satoru	NRA Commissioner
Secretariat of the NRA	Yamagata Hiroshi	Director-General for Emergency Response (attending until the 58th meeting)
	Ono Yuji	Director-General for Nuclear Regulation, Director-General's Secretariats (attending since the 59th meeting)
	Oshima Toshiyuki	Director for Nuclear Regulation (in charge of examining research reactors) (attending until the 58th meeting)
	Shima Masakazu	Director for Nuclear Regulation (in charge of examining research reactors) (attending since the 59th meeting)
	Hosono Yukio	Nuclear Regulation Research Officer

(3) Safety Oversight Team for Prototype Fast Breeder Reactor Monju Decommission

Overview

This safety oversight team, consisting of NRA Commissioners, the NRA Secretariat staff and others, was formed in January 2017 in order to continuously check the state of decommissioning of the JAEA's Fast Breeder Reactor Monju and its activities. In FY2021, five meetings were held under the team.

Members of the Study Team

NRA	Yamanaka Shinsuke	NRA Commissioner
Secretariat of the NRA	Yamagata Hiroshi	Director-General for Emergency Response (attending until the 36th meeting)
	Ono Yuji	Director-General for Nuclear Regulation, Director-General's Secretariats (attending since the 37th meeting)
	Oshima Toshiyuki	Director for Nuclear Regulation (in charge of examining research reactors) (attending until the 36th meeting)
	Shima Masakazu	Director for Nuclear Regulation (in charge of examining research reactors) (attending since the 37th meeting)
	Hosono Yukio	Nuclear Regulation Research Officer

(4) JAEA Back-end Measures Monitoring Team

Overview

A monitoring team, consisting of NRA Commissioners and NRA Secretariat staff was launched in May 2019 to deal with comprehensive issues related to the back-end measures involving the whole agency, including decommissioning of aging facilities and management of radioactive waste, and held its meeting once in FY2021.

Members of the Study Team

NRA	Tanaka Satoru	NRA Commissioner
NRA Commissioner	Ono Yuji	Director-General for Nuclear Regulation, Director-General's Secretariats
	Shima Masakazu	Director for Nuclear Regulation (in charge of examining research reactors)
	Maeda Toshikatsu	Director for Regulation of Nuclear Facilities
	Fujimori Akihiro	Nuclear Regulation Research Officer

(5) Study Team on Technical Assessment of the Atomic Energy Society of Japan Standards on the Method to Determine Radioactivity Concentration of Waste Subject to Mid-depth Disposal

Overview

The study team, consisting of NRA commissioners, NRA Secretariat staff and external experts, etc., held its meeting three times in FY2021 for technical assessment of the Atomic Energy Society of Japan standards on the method to determine radioactivity concentration of waste subject to mid-depth disposal.

Members of the Study Team

NRA	Tanaka Satoru	NRA Commissioner
External experts	Watanabe Naoko	Associate Professor, Department of Applied Quantum Science, Faculty of Engineering, Hokkaido University
	Tomita Hideki	Associate Professor, Department of Energy Science and Engineering, Graduate School of Engineering, Nagoya University
Safety Research Center, JAEA	Takeda Seiji	Group Leader, Waste and Environmental Safety Study Group, Fuel Cycle Safety Research Division
	Shimada Taro	Senior Scientist, Waste and Environmental Safety Study Group, Fuel Cycle Safety Research Division
	Shimada Asako	Senior Scientist, Waste and Environmental Safety Study Group, Fuel Cycle Safety Research Division
NRA Commissioner	Sato Gyo	Director, Regulatory Standard and Research Department
	Toyama Makoto	Director, Regulatory Standard and Research Division, Regulatory Standard and Research Department
	Sasaki Haruko	Director for Policy Planning and Coordination, Regulatory Standard and Research Department
	Otsuka Ichiro	Chief Researcher, Division of Research for Nuclear Fuel Cycle and Radioactive Waste, Regulatory Standard and Research Department
	Sato Yuko	Researcher, Division of Research for Nuclear Fuel Cycle and Radioactive Waste, Regulatory Standard and Research Department
	Furuta Yoshinori	Researcher, Division of Research for Nuclear Fuel Cycle and Radioactive Waste, Regulatory Standard and Research Department
	Maeda Toshikatsu	Safety Regulation Coordination Officer, Division of Licensing for Research Reactor, Nuclear Regulation Department
	Fujisawa Hiromi	Technical Consultant
	Kawasaki Satoru	Technical Consultant

(6) Study Team for Technical Evaluation of Japan Electric Association Standards for Digital Safety Protection Systems

Overview

The study team, consisting of NRA commissioners and NRA Secretariat staff, held its meeting twice in FY2021 for technical assessment of the Atomic Energy Society of Japan standards on digital safety protection systems.

Members of the Study Team

NRA	Tanaka Satoru	NRA Commissioner
Secretariat of the NRA	Sato Gyo	Director, the Regulatory Standard and Research Department
	Toyama Makoto	Director, Regulatory Standard and Research Division, Regulatory Standard and Research Department
	Sasaki Haruko	Director for Policy Planning and Coordination, Regulatory Standard

		and Research Department
	Imase Masahiro	Senior Expert on Nuclear Regulation, Regulatory Standard and Research Department
	Hamaguchi Yoshikane	Chief Researcher, Division of Research for Severe Accident, Regulatory Standard and Research Department
	Takita Masami	Safety Technology Expert, Division of Research for Reactor System Safety, Regulatory Standard and Research Department
	Minakawa Takefumi	Researcher, Division of Research for Reactor System Safety, Regulatory Standard and Research Department
	Sakai Hirotaka	Senior Reseacher, Division of Research for Nuclear Fuel Cycle and Radioactive Waste, Regulatory Standard and Research Department
	Fujisawa Hiromi	Technical Consultant

(7) Review Team for Continuous Safety Improvement

Overview

Continued from FY2020, the review team, consisting of NRA commissioners, external experts and NRA Secretariat staff, held its meeting four times in FY2021 to discuss a broad range of efforts to continuously improve safety of nuclear facilities including improvements made in previous efforts and progressive approaches at home and abroad, and developed a “review of discussions.”

Members of the Study Team

NRA	Fuketa Toyoshi	NRA Chairman
	Ban Nobuhiko	NRA Commissioner
External experts	Itagaki Katsuhiko	Associate Professor, Graduate School of International Social Sciences, Yokohama National University
	Ohya Takehiro	Professor, Faculty of Law, Keio University
	Katsuta Tadahiro	Professor, School of Law, Meiji University
	Kamei Zentaro	Chief Researcher, PHP Research Institute Specially appointed professor, Graduate School of Social Design Studies, Rikkyo University
	Sekimura Naoto	Vice-President, The University of Tokyo Professor, Nuclear Engineering and Management, Graduate School of Engineering, The University of Tokyo
	Yamamoto Akio	Professor, Department of Applied Energy Science, Graduate School of Engineering, Nagoya University
Secretariat of the NRA	Ogino Toru	Secretary-General
	Kaneko Shuichi	Director-General for Emergency Response, Director-General’s Secretariats
	Ichimura Tomoya	Director-General, Nuclear Regulation Department
	Kurokawa Yoichiro	Policy Planning Counselor, Director-General’s Secretariats
	Hirano Masashi	Regulatory Standard and Research Department, Technical Consultant, Nuclear Safety Regulatory Standard Division
	Shibata Nobuaki	Deputy Counselor, Legal Department, Director--General’s Secretariats
	Tsutsumi Tappei	Deputy Director, Radiation Monitoring Division, Radiation Protection Department
	Nishizaki Takanori	Planning Office, Judicial Review Office, General Affairs Division, Director-General’s Secretariats
	Tanikawa Taijun	Nuclear Regulation Expert, Nuclear Regulation Policy Planning Division, Nuclear Regulation Department
	Masaoka Hideaki	Deputy Management Director, Division of Licensing for

		Commercial Nuclear Power Plants (in charge of summarization), Nuclear Regulation Department

(8) Study Team on Thyroid Dose Monitoring in Emergencies

Overview

In the safety research project of NRA, the development of a device that can measure thyroid doses in detail has been promoted, and now the practical application of the device is in sight. A study team consisting of NRA commissioners, external experts, and NRA staff was established on February 3, 2021, for the purpose of discussing basic matters concerning the monitoring of thyroid doses in emergencies. Two meetings were held in FY2021.

Members of the Study Team

NRA Commissioner	Ban Nobuhiko	NRA Commissioner
External experts	Kurihara Osamu	Director of Department of Radiation Measurement and Dose Assessment, National Institute of Radiological Sciences, Quantum Life and Medical Science Directorate , National Institutes for Quantum Science and Technology
	Suzuki Gen	Professor and Director, International University of Health and Welfare Clinic
	Takahara Shogo	Leader of Risk Analysis Research Group, Nuclear Safety Research Center, Japan Atomic Energy Agency
	Tatsuzaki Hideo	Director of Department of Radiation Emergency Medicine, National Institute of Radiological Sciences, Quantum Life and Medical Science Directorate ,National Institutes for Quantum Science and Technology
Secretariat of the NRA	Yamada Tomoho	Director-General for Radiation Protection Strategy and Security (attended until the 3rd meeting)
	Sato Gyo	Director-General for Radiation Protection Strategy and Security (attending since the 4th meeting)
	Ono Yuji	Director, Radiation Protection Policy Planning Division (attended until the 3rd meeting)
	Nitta Akira	Director, Radiation Protection Policy Planning Division (attending since the 4th meeting)
	Honma Toshimitsu	Radiation Protection Technology Researcher, Radiation Protection Policy Planning Division
	Yamamoto Tetsuya	Radiation Protection Technology Researcher, Radiation Protection Policy Planning Division
	Mitsuhashi Yasuyuki	Director for Policy Planning and Examination, Radiation Protection Policy Planning Division (attended until the 3rd meeting)
	Tatsumi Shuji	Director for Policy Planning and Examination, Radiation Protection Policy Planning Division (attending since the 4th meeting)
	Hirase Tomohiko	Expert for exposure medicine and disaster prevention, Radiation Protection Policy Planning Division
	Kikuchi Kiyotaka	Director for Institutional, Radiation Monitoring Division (attended until the 3rd meeting)
	Maekawa Motokazu	Technical Consultant, Radiation Monitoring Division (attended until the 3rd meeting)
	Sasaki Jun	Director for Institutional, Radiation Monitoring Division (attending since the 4th meeting)

4. Committees for Specific Research and Study

(1) Committee on Oversight and Evaluation of Specified Nuclear Facilities

Overview

Meetings of the Committee on Oversight and Evaluation of the Specified Nuclear Facilities, consisting of NRA Commissioners, the NRA Secretariat staff, and external experts, were to evaluate the schedule management and safety measures for decommissioning work of TEPCO's Fukushima Daiichi NPS and to give necessary advice. In FY2021, a total of nine meetings were held.

Members of the Committee

NRA	Ban Nobuhiko	NRA Commissioner
	Tanaka Satoru	NRA Commissioner
External experts	Iguchi Tetsuo	Professor emeritus, Nagoya University
	Kittaka Yoshinori	Professor, Department of Architecture, Faculty of Urban Environmental Sciences, Tokyo Metropolitan University
	Tanaka Seiichiro	President, Futaba Town Reconstruction Promotion Council
	Tokunaga Tomochika	Professor, Department of Environment Systems, Graduate School of Frontier Sciences, The University of Tokyo
	Hachisuka Reiko	Society President of Okuma Town Society of Commerce and Industry
	Yamamoto Akio	Professor, Department of Applied Energy Science, Graduate School of Engineering, Nagoya University
Secretariat of the NRA	Sakurada Michio	Deputy Secretary-General for Technical Affairs
	Kaneko Shuichi	Director-General for Emergency Response
	Minamiyama Rikio	Regional Administrator (in charge of Fukushima)
	Takeuchi Jun	Director, Office for Accident Measures of Fukushima Daiichi Nuclear Power Station
	Iwanaga Kohei	Planning and Research Officer, Office for Accident Measures of Fukushima Daiichi Nuclear Power Station
	Shibutani Tomoki	Planning and Research Officer, Office for Accident Measures of Fukushima Daiichi Nuclear Power Station
	Hayashida Hideaki	Deputy Director, Office for Accident Measures of Fukushima Daiichi Nuclear Power Station (attended until the 93rd meeting)
	Masaoka Hideaki	Deputy Director, Office for Accident Measures of Fukushima Daiichi Nuclear Power Station (attended since the 94th meeting)
	Kobayashi Ryusuke	Director, NRA Regional Office for Fukushima Daiichi Nuclear Power Station
	Aoki Hiroomi	Chief Officer for Technical Research and Examination, Division of Research for Nuclear Fuel Cycle and Radioactive Waste
	Yasui Masaya	Special International Negotiator for Nuclear Regulation

(2) Committee on Accident Analysis of the Fukushima Daiichi Nuclear Power Station

Overview

Meetings of the Committee on Accident Analysis of the Fukushima Daiichi Nuclear Power Station, consisting of an NRA Commissioner, the NRA Secretariat staff, and external experts and researchers of Japan Atomic Energy Agency were held to examine TEPCO's Fukushima Daiichi NPS accident analysis issues from a technical aspect based on the information obtained from on-site investigation. In FY2021, a total of nine meetings were held.

Members of the Committee

NRA	Fuketa Toyoshi	NRA Chairman
External experts	Ichino Hiroyoshi	Associate Professor, National Defense Academy of Japan (attending since the 13rd meeting)
	Kadowaki Satoshi	Professor, Nagaoka University of Technology (attending since the 13rd meeting)
	Ninokata Hisashi	Professor emeritus, Tokyo Institute of Technology
	Maekawa Osamu	Senior Technical Advisor, Nuclear Damage Compensation and Decommissioning Facilitation Corporation
	Miyata Koichi	Director-General, Atomic Energy Association
	Muta Hitoshi	Associate Professor, Department of Nuclear Safety Engineering, Faculty of Engineering, Tokyo City University
Secretariat of the NRA	Sakurada Michio	Deputy Secretary-General for Technical Affairs
	Kaneko Shuichi	Director-General for Emergency Response
	Yasui Masaya	Special International Negotiator for Nuclear Regulation
	Toyama Makoto	Director, Regulatory Standard and Research Division (attending since the 21st meeting)
	Hirano Masashi	Technical Consultant, Regulatory Standard and Research Division
	Abe Yutaka	General Technical Researcher, Division of Research for Severe Accident (attending since the 20th meeting)
	Takeuchi Jun	Director, Office for Accident Measures of Fukushima Daiichi Nuclear Power Station
	Iwanaga Kohei	Planning and Research Officer, Office for Accident Measures of Fukushima Daiichi Nuclear Power Station
	Hoshi Harutaka	Chief Officer for Technical Research and Examination, Office for Accident Measures of Fukushima Daiichi Nuclear Power Station
	Kawasaki Kenji	Nuclear Regulation Research Officer, Division of Licensing for Nuclear Power Plants (attended until the 20th meeting)
	Kadoya Yutaka	Deputy Director, Division of Licensing for Nuclear Power Plants (attending since the 21st meeting)
	Kaminouchi Hisamitsu	Lecturer, Reactor Technology Training Division, NRA Human Resource Development Center
Japan Atomic Energy Agency	Maruyama Yu	Vice Director, Nuclear Safety Research Center
	Yonomoto Kousuke	Special Expert, Nuclear Safety Research Center
	Sugiyama Tomoyuki	Director, Reactor Safety Research Division, Nuclear Safety Research Center

(3) Fukushima Daiichi NPS Decommissioning and Accident Investigation Liaison and Coordination Meeting

Overview

Meetings of the Fukushima Daiichi NPS Decommissioning and Accident Investigation Liaison and Coordination Meeting, consisting of the Secretariat of the NRA, which has been conducting related research and analysis, as well as the Agency for Natural Resources and Energy, the Nuclear Damage Compensation and Decommissioning Facilitation Corporation and TEPCO, which are responsible for the decommissioning work were held to coordinate the works relating to accident analysis and decommissioning work. In FY2021, a total of two meetings were held.

Members of the Meeting

Agency for Natural Resources and Energy	Shinkawa Tatsuya	Director-General for Nuclear Accident Disaster Response (attended until the 7th meeting)
	Yumoto Keiichi	Director-General for Nuclear Accident Disaster Response (attending since the 8th meeting)
	Okuda Shuji	Director, Nuclear Accident Response Office
	Ishihara Kouji	Planning Officer, Nuclear Accident Response Office
	Nakadate Naohito	Deputy Director, Nuclear Accident Response Office (attended until the 7th meeting)
	Minagawa Shigeharu	Director, Office for Nuclear Safety Improvement, Nuclear Energy Policy Planning Division (attended until the 7th meeting)
	Morita Keisuke	Deputy Director, Office for Nuclear Safety Improvement, Nuclear Energy Policy Planning Division (attending since the 8th meeting)
Secretariat of the NRA	Kaneko Shuichi	Director-General for Emergency Response
	Takeuchi Jun	Director, Office for Accident Measures of Fukushima Daiichi Nuclear Power Station
	Iwanaga Kohei	Planning and Research Officer, Office for Accident Measures of Fukushima Daiichi Nuclear Power Station
	Hayashida Hideaki	Deputy Director, Office for Accident Measures of Fukushima Daiichi Nuclear Power Station (attended until the 7th meeting)
	Masaoka Hideaki	Deputy Director, Office for Accident Measures of Fukushima Daiichi Nuclear Power Station (attending since the 8th meeting)
	Kihara Shouji	Deputy Director, Office for Accident Measures of Fukushima Daiichi Nuclear Power Station
Nuclear Damage Compensation and Decommissioning Facilitation Corporation	Ikenoue Sanroku	Managing Director (attended until the 7th meeting)
	Fukuda Toshihiko	Senior Managing Director (attending since the 7th meeting)
	Nakano Junichi	Councilor (attending since the 4th meeting)
Tokyo Electric Power Company Holdings	Taminami Tatsuya	Managing Director, Vice President, Fukushima Daiichi Decontamination and Decommissioning Engineering Company
	Ishikawa Masumi	Executive Director in charge of Reactor Decommissioning Technology, Fukushima Daiichi Decontamination and Decommissioning Engineering Company
	Mizokami Shinya	Director, Fuel Debris Removal Program Division, Fukushima Daiichi NPS, Fukushima Daiichi Decontamination and Decommissioning Engineering Company

(4) Technical Information Committee

Overview

A meeting of the Technical Information Committee, consisting of an NRA Commissioner, NRA Secretariat division directors and others, is held approximately every month with the purpose of organizing and sharing information on accidents and failures that occurred at nuclear power plants in Japan and abroad as well as the latest scientific and technological knowledge and judging the necessity of reflecting them in the regulations. Eight meetings of the Committee were held in FY2021.

Members of the Meeting

NRA	NRA Commissioner
Secretariat of the NRA	Deputy Secretary-General for Technical Affairs
	Director-General for Emergency Response
	Director-General for Nuclear Regulation (in charge of the Regulatory Standard and Research Department)
Director-General's Secretariats	Director-General for Nuclear Regulation (in charge of inspections, international affairs and the Fukushima Daiichi NPS)
	Director, Office for International Affairs, Policy Planning and Coordination Division
	Senior Coordinator for International Collaborations
	Director of Emergency Preparedness and Response Office, Policy Planning and Coordination Division
	Director, Regulatory Standard and Research Division
	Coordination Officer for Regulatory Fundamental Technology
Regulatory Standard and Research Department	Director, Division of Research (in charge of Reactor System Safety)
	Director, Division of Research (in charge of Severe Accidents)
	Director, Division of Research (in charge of Nuclear Fuel Cycle and Radioactive Waste)
	Director, Division of Research (in charge of Earthquake and Tsunami)
Nuclear Regulation Department	Director-General, Nuclear Regulation Department
	Director, Nuclear Regulation Policy Planning Division
Divisions of Licensing	Director for Nuclear Regulation (in charge of examining commercial power reactors)
	Director for Nuclear Regulation (in charge of examining research reactors)
	Director for Nuclear Regulation (in charge of examining nuclear fuel facilities)
	Director for Nuclear Regulation (in charge of examining measures against earthquake and tsunami)
Division of Oversight	Director, Division of Oversight of Nuclear Power Plants
	Director for Nuclear Regulation (in charge of commercial power reactor oversight)
	Director for Nuclear Regulation (in charge of special inspections)
	Director for Nuclear Regulation (in charge of nuclear fuel facility oversight)
Japan Atomic Energy Agency	Chief Engineer, Regulatory & International Information Analysis Office
Secretariat	Director, Regulatory Standard and Research Division, Regulatory Standard and Research Department The Oversight Planning and Coordination Division cooperates depending on the agenda.

* When the agenda of the meeting relates to knowledge and findings concerning radiation protection, relevant divisions within the Radiation Protection Department attend the committee meeting.

(5) Technical Evaluation Committees

Overview

In order to obtain technical opinions from external experts well versed in technological fields for the NRA's prior assessments, interim assessments and post assessments, seven meetings of the following eight Technical Evaluation Committees were held in FY2021.

Members of Technical Evaluation Committees

Technical Evaluation Committee on Plant Safety

External experts	Kitada Takanori	Professor, Division of Sustainable Energy and Environment Engineering, School of Engineering, Osaka University
	Yamaji Tetsushi	Associate Professor, School of Advanced Science and Engineering, Faculty of Science and Engineering, Waseda University
	Gofuku Akio	Professor, Graduate School of Interdisciplinary Science and Engineering in Health Systems, Okayama University

Technical Evaluation Committee on Nuclear Fuel Technology

External experts	Arima Tatsumi	Associate Professor, Department of Applied Quantum Physics and Nuclear Engineering, Graduate School of Engineering, Kyushu University
	Kurosaki Ken	Professor, Research Center for Safe Nuclear System, Institute for Integrated Radiation and Nuclear Science, Kyoto University

Technical Evaluation Committee on Severe Accident

External experts	Itoi Tatsuya	Associate Professor, Graduate School of Engineering, The University of Tokyo
	Muta Hitoshi	Associate Professor, School of Integrative Science and Engineering, Tokyo City University
	Morita Kouji	Professor, Graduate School of Engineering, Kyushu University

Technical Evaluation Committee on Nuclear Fuel Cycle

External experts	Enokida Yoichi	Professor, Graduate School of Engineering, Nagoya University
	Honma Shunji	Associate Professor, Department of Applied Chemistry, Faculty of Engineering, Saitama University
	Matsumura Ken	Affiliate Professor, Department of Nuclear Safety Engineering, Faculty of Engineering, Tokyo City University
	Asanuma Noriko	Associate Professor, Department of Nuclear Engineering, School of Engineering, Tokai University

Technical Evaluation Committee on Back-end

External experts	Iguchi Tetsuo	Professor Emeritus, Nagoya University
	Kozaki Tamotsu	Professor, Faculty of Engineering, Hokkaido University
	Niibori Yuichi	Professor, Graduate School of Engineering, Tohoku University
	Yamamoto Takahiro	Deputy Director, Research Institute of Earthquake and Volcano Geology, Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology

Technical Committee on Earthquake and Tsunami

External experts	Iwata Tomotaka	Professor, Disaster Prevention Research Institute, Kyoto University
	Sakai Naoki	Deputy Director-General, Center for Advanced Research Facilities, National Research Institute for Earth Science and Disaster Resilience
	Itoi Tatsuya	Associate Professor, Graduate School of Engineering, The University of Tokyo

Technical Evaluation Committee on Radiation protection

External experts	Iimoto Takeshi	Professor, Division for Environment, Health and Safety, The University of Tokyo
	Kai Michiaki	Professor, Bunri Gakuen affliated Nippon Bunri University
	Yasuda Hiroshi	Professor, Research Institute for Radiation Biology and Medicine, Hiroshima University

Technical Evaluation Committee on Material Technology

External experts	Kasahara Naoto	Professor, Nuclear Engineering and Management, School of Engineering, The University of Tokyo
	Matsumoto Satoshi	Professor, Department of Electrical Engineering and Computer Science, Graduate School of Engineering and Science, Shibaura
	Mochizuki Masato	Professor, Division of Materials and Manufacturing Science, Graduate School of Engineering, Osaka University

5. Others

(1) NRA Policy Evaluation Meeting

Overview

It is a requirement to conduct hearing of opinions from external experts regarding policy evaluation (ex-post assessment) conducted by the NRA. The meeting was held once in FY2021 to hear opinions on policy evaluation.

Members of the NRA Policy Evaluation Meeting

External experts	Iizuka Yoshinori	President, Japan Accreditation Board Professor emeritus, The University of Tokyo
	Ohya Takehiro	Professor, Faculty of Law, Keio University
	Kamei Zentaro	Chief Researcher, PHP Research Institute Specially appointed professor, Graduate School of Social Design Studies, Rikkyo University
	Shiroyama Hideaki	Professor, Graduate School of Public Policy, The University of Tokyo Professor, Graduate Schools for Law and Politics, The University of Tokyo
	Fujita Yukiko	Professor, Faculty of Law, Gakushuin University
	Machi Asei	Freelance journalist

(2) Meeting on NRA's Administrative Project Review for FY2021

Overview

In the administrative project review, all ministries and government offices are required to clarify the status of implementation of all their projects, taking into account external opinions. Furthermore, as part of the review, an expert meeting shall be held for some of the projects for hearing external experts' opinions on problems and improvement. In FY2021, a total of three expert meetings were held.

Members of the Meeting

External experts	Iijima Hirokuni	Professor, Faculty of Economics, Chuo University
	Muramatsu Ken	Affiliate Professor, Department of Nuclear Safety Engineering, Faculty of Engineering, Tokyo City University
	Yoshida Takeshi	Certified Public Accountant, Partner, Avantia GP

(3) Meeting on Hearing Opinions of Operators regarding New Regulatory •Requirements

Overview

This meeting is held on an irregular basis whenever a necessity arises to publicly hear operators' opinions on the new regulatory requirements. In FY2021, the meeting was held once to discuss the effect of debris passing through the sump screen on the core, once to discuss actions for electromagnetic compatibility in nuclear power plants, and once to discuss the priority order of technical assessments.

Members of the Meeting

- Effect of debris passing through the sump screen on the core (May 28, 2021)

Secretariat of the NRA	Toyama Makoto	Director, Regulatory Standard and Research Division
	Sasaki Haruko	Director for Policy Planning and Coordination, Regulatory Standard and Research Division
	Tsukamoto Tadashi	Chief Officer for Technical Research and Examination, Division of Research for Reactor System Safety
	Eguchi Hiroshi	Officer for Technical Research and Examination, Division of Research for Reactor System Safety
	Kobayashi Takaaki	Chief Safety Examiner, Division of Licensing for Nuclear Power Plants
	Tanaka Toshio	Safety Examiner, Division of Licensing for Nuclear Power Plants
	Hisamitsu Jin	Senior Reactor Analysis Examiner, Division of Oversight of Nuclear Power Plants

- Actions for electromagnetic compatibility at nuclear power plants (December 16, 2021)

Secretariat of the NRA	Toyama Makoto	Director, Regulatory Standard and Research Division
	Sasaki Haruko	Director for Policy Planning and Coordination, Regulatory Standard and Research Division
	Imase Masahiro	Senior Expert on Nuclear Regulation, Division of Research for Reactor System Safety
	Ikeda Masaaki	Officer for Technical Research and Examination, Division of Research for Reactor System Safety
	Takita Masami	Safety Examiner, Division of Research for Reactor System Safety
	Sakai Hirotaka	Senior Researcher, Division of Research for Nuclear Fuel Cycle and Radioactive Waste
	Murakami Gen	Deputy Director, Nuclear Regulation Policy Planning Division

- Priority order of technical assessments in FY2022 (March 28, 2022)

Secretariat of the NRA	Toyama Makoto	Director, Regulatory Standard and Research Division
	Sasaki Haruko	Director for Policy Planning and Coordination, Regulatory Standard and Research Division
	Kojima Masayoshi	Senior officer for Technical Research and Examination, Division of Research for Reactor System Safety
	Yamazaki Hiroaki	Senior Officer for Technical Research and Examination, Division of Research for Earthquake and Tsunami
	Hibino Kenta	General Officer for Technical Research and Examination , Division of Research for Earthquake and Tsunami
	Tadauchi Itsuo	Nuclear Regulation Research Officer, Division of Licensing for Earthquake and Tsunami Measures
	Komine Taro	Safety Examiner. Division of Licensing for Earthquake and Tsunami Measures
	Murao Shuji	Senior Coordinator for Policy Planning, Division of Specified Oversight
	Kashiwagi Tomohito	Inspector Specialized in Nuclear Facilities, Division of Specified Oversight
	Fujisawa Hiromi	Technical Consultant

(4) Meeting on Continuous Improvement of Safety Evaluation of Commercial Power Reactors

Overview

With the confirmation of safety evaluation reports submitted by operators and feedback of results of discussion to other plants in mind, a meeting on continuous improvement of safety evaluation of commercial power reactors, consisting of NRA Secretariat staff, was held eight times by FY2020 to discuss continuous improvement of future safety evaluation. The meeting was not held in FY2021 because there were no opinions exchanged in the fiscal year.

Secretariat of the NRA	Yamagata Hiroshi	Director-General for Emergency Response (attended until the 8th meeting)
	Ono Yuji	Director-General for Nuclear Regulation, Director-General's Secretariats (a team member as of the end of FY2021)
	Taguchi Tatsuya	Director for Nuclear Regulation (in charge of examining commercial power reactors)
	Fujimori Akihiro	Nuclear Regulation Research Officer (attended until the 8th meeting)
	Togasaki Ko	Deputy-Director for Nuclear Regulation

(5) Public Meeting on Inspections for Commercial Power Reactor

- **Public meeting to investigate and analyze the cause of the rewriting of borehole map data at Tsuruga NPS Unit 2**

Overview

In FY2021, two public meeting was held to confirm the validity of the investigation and analysis of the cause of the rewriting of the borehole map data of Tsuruga NPS Unit 2 by the operator.

Members of the Public Meeting

Secretariat of the NRA	Koganeya Toshiyuki	Director, Oversight Planning and Coordination Division
	Kosaka Atsuhiko	Senior Coordinator for Policy Planning

(6) Research Evaluation Committee and Research Results Report Meeting (Radiation Safety Research Promotion Program)

Overview

For the Radiation Safety Research Promotion Program which was launched in FY2017, the NRA publicly seeks research project offers for the priority research areas set by the NRA every fiscal year.

In FY2021, which is the final year of this program, while the research projects adopted from those applied to public offering by FY2020 were promoted, the Research Evaluation Committee held its meeting twice to evaluate the project results so far, and the Debriefing Session of Research Results was held once to accept reports from the representative of research teams.

Research Evaluation Committee

External experts	Urabe Itsumasa	Professor Emeritus, Fukuyama University
	Oda Keiji	Executive Board Director, Electron Science Institute Professor Emeritus, Kobe University
	Suzuki Gen	Professor and Director, International University of Health and Welfare Clinic
	Futatsugawa Shoji	Radiation Safety Officer, Alpha Tau Medical
	Yoshida Hiroko	Associate Professor, Radioisotope Research and Education Center, Graduate School of Pharmacy, Tohoku University

(7) Debriefing Session of Emergency Drills by Nuclear Operators

Overview

Regarding nuclear emergency drills conducted by nuclear operators, a debriefing session was held once in FY2021, led by Chairman Fuketa, Commissioners Tanaka and Yamanaka with the aim of strengthening information sharing between the NRA Secretariat and the operators and improving the emergency response capabilities. In addition, two working groups were held under the debriefing session to discuss scenarios related to training for improving the judging ability of the commanders of nuclear power plants' emergency response centers and central control rooms and also training for enhancing on-site response ability.

Members of the Debriefing Session

NRA	Fuketa Toyoshi	NRA Chairman
	Tanaka Satoru	NRA Commissioner
	Yamanaka Shinsuke	NRA Commissioner
Secretariat of the NRA	Kaneko Shuichi	Director-General for Emergency Response
	Ichimura Tomoya	Director-General, Nuclear Regulation Department
	Ono Yuji	Director General for Nuclear Regulation
	Koganeya Toshiyuki	Director, Emergency Preparedness and Response Office
	Murata Shinichi	Director, Public Information Office
	Kaneko Masayuki	Director, Accidents Response Office
	Takeuchi Atsushi	Director, Office for Accident Measures of the Fukushima Daiichi NPS
	Taguchi Tatsuya	Director, Division of Licensing for Nuclear Power Plants
	Amano Naoki	Nuclear Regulation Research Officer, Division of Licensing for Nuclear Power Plants
	Iwata Junichi	Nuclear Regulation Research Officer, Division of Licensing for Earthquake and Tsunami Measures
	Kawasaki Kenji	Director for Policy Planning and Coordination, Emergency Preparedness and Response Office
	Hirano Go	Deputy Head, Emergency Preparedness and Response Office
	Wada Takeru	Expert for Nuclear Preparedness and Operation Control, Emergency Preparedness and Response Office
Cabinet Office	Matsushita Hitoshi	Director-General for Nuclear Regulation Policy of Nuclear Emergency Preparedness

(8) Opinion Hearing Meeting on Volcanic Formation Mechanisms, etc.

Overview

At the 60th FY2021 NRA Commission Meeting (January 19, 2022), the policy for reviewing matters that should be considered at least for ensuring safety in geological disposal (hereinafter referred to as "matters to be considered") was agreed. It was also agreed to hear views of external experts for expanding scientific and technical knowledge on the characteristics of volcanic formation mechanisms in Japan and their regional characteristics before commencing discussions. The meeting was held twice in FY2021.

Members of the Meeting

NRA	Ishiwatari Akira	NRA Commissioner
	Tanaka Satoru	NRA Commissioner
External experts	Okuno Mitsuru	Professor, Department of Earth Sciences, Faculty of Science, Fukuoka University
	Nakamura Michihiko	Professor, Graduate School of Science, Tohoku University
	Yamamoto Takahiro	Deputy Director, Research Institute of Earthquake and Volcano Geology, Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology
Secretariat of the NRA	Ichimura Tomoya	Director-General, Nuclear Regulation Department
	Shima Masakazu	Director for Nuclear Regulation (in charge of examining research reactors)
	Ohmura Tetsuo	Researcher, International Nuclear Safety Regulatory System
	Maeda Toshikatsu	Deputy-Director for Nuclear Regulation

(9) Meeting on the Need of Applications for Approval to Change Basic Design to Incorporate Standard Response Spectrum into Regulations

Overview

The NRA held this meeting nine times in total to proceed with reviews on determining the need to change design basis ground motion for nuclear facilities, for which operators submitted documents explaining that change in design basis ground motion was not required, in the procedure after the revisions to the interpretation of the incorporation of standard response spectrum into regulations (April 21, 2021), and completed all deliberations.

Members of the Meeting

NRA	Ishiwatari Akira	NRA Commissioner
Secretariat of the NRA	Ichimura Tomoya	Director-General, Nuclear Regulation Department
	Oasada Kaoru	Director for Nuclear Regulation (in charge of examining measures against earthquake and tsunami), Nuclear Regulation Department
	Naito Hiroyuki	Nuclear Regulation Research Officer, Division of Licensing for Earthquake and Tsunami Measures
	Koyamada Takumi	Regulation Research Officer, Division of Licensing for Earthquake and Tsunami Measures (attended until the 1st meeting)
	Iwata Junichi	Nuclear Regulation Research Officer, Nuclear Regulation Research Officer, Division of Licensing for Earthquake and Tsunami Measures

(10) Information Exchange Meeting on the Inspection Program

Overview

The meeting was started in April 2020 to exchange information with external experts and nuclear operators for continuous improvement of nuclear regulatory inspections, and three meetings, 6th to 8th meetings, were held in FY2021.

Members of the Meeting

NRA	Tanaka Satoru	NRA Commissioner
External experts	Katsuta Tadahiro	Professor, School of Law, Meiji University
	Takahashi Shigeru	Professor, School of Law, Hosei University
	Sekimura Naoto	Professor, Graduate School of Engineering, The University of Tokyo
	Yoneoka Yuko	Former Managing Director and Secretary General of Japan Accreditation Board
	Kondo Hiroko	Graduate School of Engineering, The University of Tokyo / Project General Manager of expert personnel for academic support concerning the effective implementation of the new regulatory system in Thermal Hydraulics Division, Atomic Energy Society of Japan
Secretariat of the NRA	Morishita Yasushi	Director-General for Nuclear Regulation (attending since the 7th meeting)
	Kaneko Shuichi	Director-General for Nuclear Regulation (attended until the 6th meeting)
	Koganeya Toshiyuki	Director, Oversight Planning and Coordination Division
	Takeyama Shoji	Director for Nuclear Regulation (in charge of commercial power reactor oversight)
	Kadono Toshiyuki	Director for Nuclear Regulation (in charge of nuclear fuel facility oversight)
	Sugimoto Takanobu	Director for Nuclear Regulation (in charge of special inspections)

(11) Public Meeting on Improvement of Legal Reports based on the Reactor Regulation Act

Overview

The meeting was held twice in FY2021 to discuss continuous improvements including the consolidation of nuclear regulatory inspections that started operating in FY2020 as to the reports of accidents and troubles based on the Nuclear Reactor Regulation Act.

Members of the Meeting

Secretariat of the NRA	Kaneko Shuichi	Director-General for Nuclear Emergency Response
	Koganeya Toshiyuki	Director, Oversight Planning and Coordination Division
	Motohashi Takayuki	Director for Policy Planning